

THE PHILIPPINE JOURNAL OF SCIENCE

VOL. I

AUGUST 15, 1906

SUPPLEMENT III

NEW OR NOTEWORTHY PHILIPPINE PLANTS, V.

By ELMER D. MERRILL.

(*From the botanical section of the Biological Laboratory, Bureau of Science.*)

INTRODUCTION.

The present article has been prepared as material and data became available, as was the case with the previous papers published under the above title.¹ Our receipts of Philippine botanical material from various sources approximate 5,000 numbers annually and the percentage of undescribed species and interesting forms is very large, as is to be expected in a region botanically so little known as is this Archipelago. In making the preliminary identifications, immediately after the receipt of the material in the herbarium, many of the interesting forms are detected and described, but in this paper, as in the preceding ones of the series, only a portion of these forms are considered. Practically no work in some groups can at present be done in Manila, owing to a lack of literature; in certain ones, all material is submitted to specialists for identification and report. Frequently, specific identifications can not be made at once, because of a lack of complete material, so that several hundred sheets, apparently representing undescribed species, remain in the herbarium of this Bureau and for one reason or another these will need to be considered at a later date. In general, it is not considered good policy to describe species based on a single specimen and many of the apparently undescribed plants at present in our herbarium have no corresponding duplicate material.

¹ *Publications of the Bureau of Government Laboratories* (1904-5), 6, 17, 29, 35.

In this paper a large number of genera which were previously unknown from the Philippines are for the first time reported, their representatives in some cases being species heretofore undescribed and, in others, well-known plants which for the first time have been encountered in the Archipelago.

Rolfe² makes it clear that the Philippine flora has distinct connections with that of the neighboring lands, but, at the time he wrote, comparatively little was known regarding this flora or that of the regions immediately to the north and south. In the past twenty years much work has been done by various authors; 1905 has seen the completion of Forbes and Hemsley's work on the flora of China,³ and in 1898 Koorders published his compilation of that of Celebes.⁴

Rolfe, in 1884, knew but three species common to the Philippines and Celebes and confined to these two regions and only about sixteen which he considered to represent northern or continental types; therefore it has been thought advisable here to enumerate some of the more striking representatives both of the southern connection with Celebes and of the northern one with Formosa, Japan, and the Asiatic Continent, especially as Usteri,⁵ publishing as recently as the year 1905, has added nothing to the twenty-year-old list of Rolfe.

The list of species confined to Celebes and the Philippines and common to both has been extended from the three mentioned in 1884 to about sixty given below, while many others extending from the Philippines through Celebes to neighboring islands, have been enumerated. The list, so far as Celebes is concerned, is based largely on Koorders' work, cited above. Koorders⁶ remarks that the relationship between the Philippine and Celebes flora is very prominent, but does not discuss the connections in detail.

In the following table the cross (+) indicates that the species is found in Luzon and Celebes and, unless noted to the contrary in the last column, that it is known only from the two regions. The dash (—) indicates that the Philippine species is represented in Celebes by a closely related one or a variety. The question mark indicates a Philippine species doubtfully credited to Celebes by Koorders. Where the range of the species is known to extend beyond Celebes, its distribution is given in the last column. Specimens of most of the species enumerated are in the herbarium of this Bureau.

² On the Flora of the Philippine Islands and Its Probable Derivation, *Journ. Linn. Soc. Bot.* (1884), **21**, 283–316.

³ An Enumeration of All the Plants Known from China Proper, Formosa, Hainan, Corea, the Luchu Archipelago, and the Island of Hongkong, etc., *Journ. Linn. Soc. Bot.* (1886–1905), **23**, **26**, **36**.

⁴ Verslag eener Botanische Dienstreis door de Minahasa, tevens eerste overzicht der Flora van N. O. Celebes, *Meded. 's Lands. Plant.* (1898), **19**.

⁵ *Beiträge zur Kenntniss der Philippinen und ihrer Vegetation* (1905), **3**.

⁶ *Loc. cit.*, 258.

Table showing floristic relationship between the Philippines and Celebes.

Species.	Philippines.	Celebes.	Other distribution.
POLYPODIACEÆ:			
Polypodium angustatum Blume	+	+	Java.
Polypodium vulcanicum Blume	+	+	Sunda Islands.
Polypodium heracleum Kunze	+	+	Java.
Polypodium setosum Blume	+	+	Java.
Polypodium stenophyllum Blume	+	+	Java.
Polypodium decrescens Christ	+	+	
Lindsaya sarasinorum Christ	+	+	
Lindsaya retusa Mett	+	+	New Guinea.
Callipteris alismaefolia J. Sm	+	+	
Diplazium deltoideum Christ	+	+	
Athyrium sarasinorum var. philippinense Christ	+	—	
Pteris heteromorpha Fée	+	+	
Hymenolepis platyrhynchos Kunze	+	+	
Niphobolus sphaerostichus Copel	+	+	
Aspidium aculeatum var. batjanense Christ	+	+	Batjan.
CYPERACEÆ:			
Cyperus pubisquama Steud	+	+	
ARACEÆ:			
Epipremnum elegans Engl	+	+	
Pothodium lobbianum Schott	+	+	Moluccas, Ternate.
Scindapsus argyrea Engl	+	+	
Spathiphyllum commutatum Schott	+	+	Amboina.
DIOSCOREACEÆ:			
Dioscorea n. sp	+	+	
MYRICACEÆ:			
Myrica javanica Blume	+	+	Java.
FAGACEÆ:			
Quercus campanoana Vid	+	+	
Quercus blancoi A. DC	+	+	
Quercus celebica Blume	+	+	
ULMACEÆ:			
Celtis philippinensis Blanco	+	(?)	
URTICACEÆ:			
Ficus caulocarpa Miq	+	+	Borneo.
Ficus chrysolepis Miq	+	+	
Ficus clusioides Miq	+	+	
Ficus forstenii Miq	+	+	Timor, Borneo.
Ficus manillensis Warb	+	—	
Ficus minahassae Miq	+	+	
PITTOSPORACEÆ:			
Pittosporum resiniferum Hemsl	+	(?)	
LEGUMINOSÆ:			
Clianthus binnendyckianus S. Kurz	+	+	Ceram (?).
Dalbergia minahassae Prain	+	+	
Gleditschia rolfei Vid	+	+	
Pithecolobium subacutum Benth	+	+	
Pterocarpus echinatus Pers	+	+	
Wallaceodendron celebicum Koord	+	+	
RUTACEÆ:			
Lunasia amara Blanco	+	+	Java.
Micromelum molle Turcz	+	+	
Micromelum tephrocarpum Turcz	+	+	
Evodia latifolia DC	+	+	Halmaheira.

Table showing floristic relationship between the Philippines and Celebes—Continued.

Species.	Philippines.	Celebes.	Other distribution.
BURSERACEÆ:			
Garuga abilo (Blco.) Merr -----	+	+	Amboina, New Guinea, Samoa.
MELIACEÆ:			
Reinwardtiodendron merrillii Perk -----	+	—	
Aglaia macrobotrys Turcz -----	+	+	
Aglaia argentea Blume -----	+	+	Java.
Aglaia monophylla Perk -----	+	—	
MALPIGHIACEÆ:			
Ryssopteris dealbata Juss -----	+	+	
EUPHORBIACEÆ:			
Actephila gigantea Koord -----	+	+	
Cleistanthus cupreus Vid -----	+	+	
Mallotus cumingii Muell. Arg -----	+	+	
Mallotus leucocalyx Muell. Arg -----	+	+	
Glochidion album Boerl -----	+	+	
Macaranga hispida Muell. Arg -----	+	+	Moluccas.
ANACARDIACEÆ:			
Semecarpus perrottetii March -----	+	+	
Koordersiodendron pinnatum Merr -----	+	+	New Guinea.
SAPINDACEÆ:			
Cubilia blancoi Blume -----	+	+	Boeroe, Ceram.
Tristira pubescens Merr -----	+	—	
ELAEOCARPACEÆ:			
Elaeocarpus cumingii Turcz -----	+	+	
TILIACEÆ:			
Columbia serratifolia DC -----	+	+	
STERCULIACEÆ:			
Sterculia oblongata R. Br -----	+	+	
Sterculia stipularis R. Br -----	+	(?)	
THEACEÆ:			
Ternstroemia toquian F. -Vill -----	+	+	
MELASTOMATACEÆ:			
Medinilla cumingii Naud -----	+	+	
Medinilla teysmannii Miq -----	+	+	New Guinea.
Astronia cumingiana Vid -----	+	+	
Memecylon preslianum Triana -----	+	+	
ARALIACEÆ:			
Tetraplasandra philippinensis Merr -----	+	—	New Guinea (—).
Anompanax philippinensis Harms -----	+	—	
Boerlagiodendron pulcherrimum Harms -----	+	—	
ERICACEÆ:			
Vaccinium microphyllum Blume -----	+	+	
Rhododendron apoanum Stein -----	+	—	
MYRSINACEÆ:			
Rapanea avenis Mez -----	+	+	Java.
SAPOTACEÆ:			
Palaquium celebicum Burck -----	+	+	
LOGANIACEÆ:			
Couthovia celebica Koord -----	+	+	
Fagraea plumeriaefolia A. DC -----	+	+	
Strychnos celebica Koord -----	+	+	
APOCYNACEÆ:			
Ichnocarpus ovatifolius A. DC -----	+	+	
Tabernaemontana cumingiana A. DC -----	+	+	

Table showing floristic relationship between the Philippines and Celebes—Continued.

Species.	Philippines.	Celebes.	Other distribution.
ASCLEPIADACEÆ:			
Dischidiopsis philippinensis Schltr.-----	+	—	New Guinea (—).
CONVOLVULACEÆ:			
Bonamia semidigyna var. farinosa Hallier--	+	+	Banca, Lepar.
VERBENACEÆ:			
Geunsia cumingiana Rolfe-----	+	+	
Premna cumingiana Schauer-----	+	+	
Clerodendron blancoi Naves-----	+	—	
ACANTHACEÆ:			
Eranthemum zollingerianum Nees-----	+	+	
Hemigraphis cumingiana Nees-----	+	+	
Hemigraphis rapifera Hallier-----	+	+	
Hemigraphis primulifolia F.-Vill-----	+	+	New Guinea.
BIGNONIACEÆ:			
Nycticalos cuspidatum Miq-----	+	+	Moluccas.
CUCURBITACEÆ:			
Momordica ovata Cogn-----	+	+	

Notes on the above table.—*Dioscorea* sp. nov. is the species enumerated by Koorders as *D. glabra* Roxb., but which is a distinct undescribed one according to Dr. Prain in lit. and which has also been found in the Philippines. *Gleditschia rolfei* Vid.; *G. celebica* Koord., is a synonym. *Pterocarpus echinatus* Pers. (*P. vidalianus* Rolfe) is also known from Salajar Island, south of Celebes.⁷ *Wallaceodendron celebicum* Koord., a monotypic genus, first found in Celebes and later discovered in the central Philippines. *Reinwardtioidendron merrillii* Perk., a genus of two species, one Celebes and one Philippine. *Koordersiodendron pinnatum* (Blanco) Merr., a monotypic genus known from the Philippines, Celebes, and New Guinea. *Cubilia blancoi* Blume, a monotypic genus known from Luzon, Celebes, Boeroe, and Ceram, *Cubilia rumphii* Blume being a synonym. *Anompanax philippinensis* Harms., a genus comprising two species, one Celebes and one Philippine. *Vaccinium microphyllum* Blume, see page 221.

Whereas the Celebes connections are very strikingly shown in the above table, the semi-temperate or continental element in the highlands of northern Luzon is nearly as prominent, as is shown by the following one. The latter undoubtedly is far from complete and therefore, when more extensive collections are made and our present material has more thoroughly been worked over with reference to Asiatic types and compared with them, the number of species will undoubtedly be greatly enlarged.

The northern element in the Philippine flora.—In the following table, as in the preceding, the cross (+) indicates that the species is found in Luzon and in the region for which the sign is entered, whereas the dash (—) means that the Philippine species is represented by a closely related form in the region indicated, or, in the last column, that the general generic distribution is northern and not Malayan. The majority

⁷ Merrill: *Publications of Bureau of Government Laboratories* (1904), 17, 20.

of the genera so indicated are unknown from the Malayan region. Specimens of all the species enumerated are in the herbarium of this Bureau.

Table showing the northern element in the Philippine flora.

Species.	Luzon.	Formosa.	Japan.	China.	Northern India.	Europe.	North America.	Java, Sumatra, or Borneo.	Of general northern generic distribution.
POLYPODIACEÆ:									
Cheilanthes argentea Hook.....	+	-----	+	+	+	-----	-----	-----	-----
Aspidium fauriei var. elatius Christ.....	+	-----	—	-----	-----	—	-----	—	-----
Polypodium mengsteense Christ.....	+	-----	-----	+	-----	-----	-----	-----	-----
Polystichum varium Presl.....	+	-----	+	+	-----	-----	-----	-----	-----
Nephrodium erythrosorum Hook.....	+	-----	+	+	+	-----	-----	-----	-----
Diplazium japonicum Thunb.....	+	-----	+	+	+	-----	-----	-----	-----
GLEICHENIACEÆ:									
Gleichenia laevissima Christ.....	+	-----	-----	+	-----	-----	-----	-----	-----
PINACEÆ:									
Pinus insularis Endl.....	+	-----	-----	-----	-----	-----	-----	-----	—
Pinus merkusii J. et DeVr.....	+	-----	-----	-----	-----	-----	-----	+	—
GRAMINEÆ:									
Agrostis elmeri Merr.....	+	-----	—	—	-----	-----	-----	—	—
Calamagrostis filifolia Merr.....	+	-----	-----	-----	-----	-----	-----	-----	—
Calamagrostis arundinacea var. nipponica Hack.....	+	-----	+	—	—	-----	-----	-----	—
Poa luzoniensis Merr.....	+	-----	-----	-----	-----	-----	-----	-----	—
Pollinia quadrinervis Hack.....	+	-----	+	+	+	-----	-----	-----	-----
Pollinia nuda Trin.....	+	-----	+	+	+	-----	-----	-----	-----
Pollinia imberbis var. willdenowiana Hack.....	+	-----	-----	-----	+	-----	-----	-----	-----
Arthraxon microphyllum Hochst.....	+	-----	-----	-----	+	-----	-----	-----	-----
Eremochloa leersioides Hack.....	+	-----	-----	+	-----	-----	-----	-----	-----
Brachypodium silvaticum Beauv. var. nov.....	+	-----	—	—	—	—	—	-----	—
Anthoxanthum luzoniense Merr.....	+	-----	-----	-----	—	-----	-----	-----	—
Coelachne hackeli Merr.....	+	-----	—	—	—	-----	-----	-----	—
CYPERACEÆ:									
Carex, about 14 species.....	+	-----	-----	-----	-----	-----	-----	-----	—
JUNCACEÆ:									
Juncus, 2 species.....	+	-----	-----	-----	-----	-----	-----	-----	—
LILIACEÆ:									
Aletris spicata Franch.....	+	+	+	+	-----	-----	-----	-----	—
Disporum pullum Salisb.....	+	+	+	+	+	-----	+	-----	—
Ophiopogon japonicus Salisb.....	+	+	+	+	-----	-----	-----	-----	—
Lilium philippinense Baker.....	+	-----	-----	-----	-----	-----	-----	-----	—
PIPERACEÆ:									
Saururus loureirii Deene.....	+	+	-----	+	-----	-----	-----	-----	—
SALICACEÆ:									
Salix azaolana Blanco.....	+	—	-----	—	—	-----	-----	-----	—
MYRICACEÆ:									
Myrica rubra S. & Z.....	+	+	+	+	+	-----	-----	+	—

Table showing the northern element in the Philippine flora—Continued.

Species.	Luzon.	Formosa.	Japan.	China.	Northern India.	Europe.	North America.	Java, Sumatra, or Borneo.	Of general northern generic distribution.
URTICACEÆ:									
Chamabainia squamigera Wedd ----	+	-----	-----	-----	+	-----	-----	-----	—
Debregeasia longifolia Wedd -----	+	-----	-----	-----	+	-----	-----	+	—
CARYOPHYLLACEÆ:									
Stellaria laxa Merr -----	+	-----	+	+	+	-----	-----	+	—
RANUNCULACEÆ:									
Ranunculus n. sp -----	+	-----	-----	-----	-----	-----	-----	-----	—
Anemone luzoniensis Rolfe -----	+	-----	-----	-----	-----	-----	-----	-----	—
BERBERIDACEÆ:									
Berberis barandana Vidal -----	+	-----	-----	-----	-----	-----	-----	-----	—
Mahonia nepalensis DC -----	+	-----	+	+	+	-----	-----	-----	—
CRUCIFEREÆ:									
Cardamine parviflora Linn -----	+	+	+	+	+	+	+	-----	—
CRASSULACEÆ:									
Sedum australe Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
SAXIFRAGACEÆ:									
Astilbe n. sp. (A. rivularis Vid.) -----	+	-----	-----	-----	—	-----	-----	-----	—
Deutzia pulchra Vid -----	+	-----	-----	-----	-----	-----	-----	-----	—
Hydrangea lobbia Maxim -----	+	-----	-----	-----	-----	-----	-----	-----	—
Itea macrophylla Wall -----	+	-----	-----	-----	+	-----	-----	-----	—
Dichroa febrifuga Lour -----	+	-----	-----	+	+	-----	-----	+	—
ROSACEÆ:									
Fragaria indica Andr -----	+	+	+	+	+	-----	-----	-----	—
Rosa multiflora Thunb -----	+	+	+	+	-----	-----	-----	-----	—
Rubus tagallus Cham. & Sch -----	+	+	-----	+	-----	-----	-----	-----	—
Rubus rosaefolius Sm -----	+	-----	-----	+	-----	-----	-----	-----	—
RUTACEÆ:									
Boenninghausenia albiflora Reichb -----	+	+	+	+	+	-----	-----	-----	—
Skimmia japonica Thunb -----	+	+	+	—	-----	-----	-----	-----	—
POLYGALACEÆ:									
Polygala glomerata Lour -----	+	-----	+	+	-----	-----	-----	-----	—
CORIARIACEÆ:									
Coriaria intermedia Mats -----	+	+	—	—	-----	-----	-----	-----	—
ACERACEÆ:									
Acer philippinum Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
Acer sp. indet -----	+	-----	-----	-----	-----	-----	-----	-----	—
VIOLACEÆ:									
Viola patricinii DC -----	+	-----	+	+	+	-----	-----	-----	—
MELASTOMATACEÆ:									
Sarcopyramis n. sp -----	+	-----	-----	-----	—	-----	-----	—	—
OENOTHERACEÆ:									
Epilobium, 2 species -----	+	-----	-----	-----	-----	-----	-----	-----	—
HALORRHAGACEÆ:									
Halorrhagis scabra, var. elongata Schindl -----	+	-----	-----	+	—	-----	-----	-----	—
ARALIACEÆ:									
Acanthopanax trifoliatum (L.) Merr -----	+	+	+	+	+	-----	-----	-----	—

Table showing the northern element in the Philippine flora—Continued.

Species.	Luzon.	Formosa.	Japan.	China.	Northern India.	Europe.	North America.	Java, Sumatra, or Borneo.	Of general northern generic distribution.
ERICACEÆ:									
Rhododendron, 14 species -----	+	-----	-----	-----	-----	-----	-----	-----	—
Vaccinium, 10 species -----	+	-----	-----	-----	-----	-----	-----	-----	—
Gaultheria, 3 species -----	+	-----	-----	-----	-----	-----	-----	-----	—
MYRSINACEÆ:									
Amblyanthopsis n. sp -----	+	-----	-----	-----	—	-----	-----	-----	—
PRIMULACEÆ:									
Lysimachia microphylla Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
Lysimachia ramosa Wall -----	+	-----	-----	-----	+	-----	-----	+	—
Androsace saxifragifolia Bunge -----	+	+	+	+	+	-----	-----	-----	—
SYMPLOCACEÆ:									
Symplocos lancifolia S. & Z -----	+	-----	-----	+	-----	-----	-----	-----	-----
OLEACEÆ:									
Fraxinus philippinensis Merr -----	+	-----	-----	—	-----	-----	-----	-----	—
Ligustrum cumingianum Decne -----	+	-----	-----	-----	-----	-----	-----	-----	—
GENTIANACEÆ:									
Gentiana, 3 species -----	+	-----	-----	-----	-----	-----	-----	-----	—
Crawfordia luzoniensis Vid -----	+	-----	-----	-----	-----	-----	-----	-----	—
HYDROPHYLLACEÆ:									
Ellisiophyllum reptans Maxim -----	+	-----	+	-----	-----	-----	-----	-----	—
BORRAGINACEÆ:									
Bothriospermum tenellum F. & M -----	+	+	+	+	+	-----	-----	-----	—
Trigonotis philippinensis Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
VERBENACEÆ:									
Callicarpa formosana Rolfe -----	+	+	+	—	-----	-----	-----	-----	—
LABIATÆ:									
Ajuga n. sp -----	+	-----	-----	-----	-----	-----	-----	-----	—
Plectranthus diffusa Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
Plectranthus sp -----	+	-----	-----	-----	-----	-----	-----	-----	—
Scutellaria luzonica Rolfe -----	+	+	—	—	—	-----	-----	-----	—
SCROPHULARIACEÆ:									
Alectra dentata O. Ktze -----	+	-----	-----	+	+	-----	-----	-----	—
Euphrasia borneensis Stapf -----	+	-----	-----	-----	-----	-----	-----	+	—
Sopubia trifida Ham -----	+	-----	-----	+	+	-----	-----	-----	—
RUBIACEÆ:									
Galium philippinensis Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
CAPRIFOLIACEÆ:									
Lonicera rehderi Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
Lonicera philippinensis Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
Viburnum luzonicum Rolfe -----	+	-----	-----	-----	-----	-----	-----	-----	—
Viburnum odoratissimum Ker -----	+	-----	+	+	+	-----	-----	-----	—
Viburnum sinuatum Merr -----	+	-----	-----	-----	-----	-----	-----	-----	—
CAMPANULACEÆ:									
Lobelia nicotianaefolia Heyne -----	+	-----	-----	-----	+	-----	-----	-----	—
Pratia begoniaefolia Lindl -----	+	+	+	+	-----	-----	-----	+	—
Peracarpa n. sp -----	+	-----	-----	-----	—	-----	-----	-----	—

Table showing the northern element in the Philippine flora—Continued.

Species.	Luzon.	Formosa.	Japan.	China.	Northern India.	Europe.	North America.	Java, Sumatra, or Borneo.	Of general northern generic distribution.
COMPOSITÆ:									
Aster, 2 species	+	-----	-----	-----	-----	-----	-----	-----	—
Artemesia parviflora Roxb	+	-----	-----	-----	+	-----	-----	-----	—
Ainslaea reflexa Merr	+	-----	-----	—	—	-----	-----	—	—
Carpesium cernuum Linn	+	-----	-----	+	+	+	-----	-----	—
Cnicus wallichii Clarke	+	-----	-----	-----	+	-----	-----	-----	—
Dichrocephala chrysanthemifolia DC	+	-----	-----	+	+	-----	-----	-----	—
Anaphalis cinnamomea Clarke	+	-----	+	+	+	-----	—	-----	—
Gnaphalium, 3 species	+	-----	-----	-----	-----	-----	-----	-----	—
Eupatorium lindleyanum DC	+	+	+	+	-----	-----	-----	-----	—
Lactuca thunbergiana Maxim	+	+	+	+	-----	-----	-----	-----	—
Lactuca brevirostris Champ	+	-----	+	+	-----	-----	-----	-----	—
Myriactis humilis Merr	+	-----	-----	-----	-----	-----	-----	-----	—
Senecio, 5 species	+	-----	-----	-----	-----	-----	-----	-----	—
Solidago virgaurea L	+	+	+	+	+	+	+	-----	—
Vernonia philippinensis Rolfe	+	—	-----	—	-----	-----	-----	-----	-----

Notes on the above table.—*Chamabainia squamigera*, a monotypic Asiatic genus. *Sedum australis* is the most southern species of the genus known in the Eastern Hemisphere. *Polygala glomerata*: This species is included, but the specimen referred to is from Mindanao, not as yet having been found in Luzon. Several other species of *Polygala* are known from the Philippines. *Viola patricinii*: Three other species of *Viola* are represented in material recently collected in northern Luzon, one of these has also been found in Mindanao. *Sarcopyramis* is a monotypic Himalayan genus, the Luzon plant apparently representing an undescribed form. *Epilobium*: One or both forms may be undescribed. *Rhododendron* and *Vaccinium* include the total species known from the Philippines. *Amblyanthopsis*, an Asiatic genus of two species from Bhotan and Assam, a third undescribed species in Luzon. *Ellisiophyllum reptans* is a monotypic genus previously known only from Japan. *Peracarpa*, an undescribed form, the genus previously containing but one Himalayan species. *Solidago virgaurea*: This is its most southern range in the Eastern Hemisphere.

PANDANACEÆ.

FREYCINETIA Gaudich.

Freycinetia rostrata Merrill sp. nov. § *Pleiostigma*.

A scandent, glabrous plant with terminal, globose heads, usually in threes, and broadly-lanceolate, somewhat acuminate leaves 6 to 11 cm. long, the margins with very few scattered small teeth. Branches brownish gray, 5 mm. or less in diameter, obscurely angled. Leaves 1.5 to 2.4 cm. wide, narrowed below to the short flattened petiole, the margins often

recurved, nearly or quite entire below, above with few small scattered teeth which are not spine-like. Heads about 1.5 cm. in diameter, globose, the peduncles from the apices of the branches 1 to 1.5 cm. long. Drupes many, but most of them aborted, narrowly ovoid, about 8 mm. long, narrowed above into a rostrate apex about 2 mm. long. Stigmas 4.

MINDANAO, Lake Lanao, Camp Keithley (475 Mrs. Clemens) April, 1906.

PANDANUS Linn.

Pandanus clementis Merrill sp. nov. § *Sussea*. (Pl. I.)

A tree about 10 m. high, branched above, with ovoid, 3 to 4.5 cm. long heads, arranged in terminal condensed spikes, about 8 heads in each spike, each head subtended by a large broadly-ovate to oblong-ovate, acute or very shortly abruptly acuminate bract, the drupes indefinite, 10 to 12 mm. long. Ultimate branches about 1.5 cm. in diameter. Leaves 60 cm. long or more, 2 to 2.5 cm. wide, the margins with small antrorse spines throughout, the midrib above glabrous, beneath at the base with a few retrorse spines and near the apex finely antrorsely denticulate, the apex short acuminate. Heads red when mature, ovoid, obtuse, obscurely obtusely 3-angled, 3 to 4.5 cm. long, 2.5 to 3 cm. in diameter, the bracts gradually smaller upwards, 4 to 6 cm. long, 3 to 4 cm. wide, acute or very shortly acuminate, serrulate on the keel and margins above. Drupes very many in each head, 10 to 12 mm. long, 3 to 4 mm. thick above, gradually narrowed below, somewhat angular, the apical portion convex, slightly ribbed. Stigma terminal, central, 1 to 1.5 mm. in diameter.

MINDANAO, Lake Lanao, Camp Keithley (Mrs. Clemens) March, 1906. Altitude about 800 m.

GRAMINEÆ.

ANTHOXANTHUM Linn.

Anthoxanthum luzoniense Merrill sp. nov.

Erect, glabrous, 40 to 60 cm. high, very fragrant in drying. Culms glabrous; nodes slightly pubescent with short appressed hairs; sheaths usually exceeding the internodes, often loose, the margins above slightly pubescent; ligule broad, ovate, obtuse, irregularly cleft or lacerate, hyaline, about 4 mm. long; blades 11 to 18 cm. long, 4 to 5 mm. wide, glabrous, smooth, flat or revolute when dry. Panicles exserted, rather dense, many flowered, 6 to 8 cm. long, 1 to 1.5 cm. in diameter, the lower branches about 3 cm. long, appressed-ascending, densely flowered. First glume hyaline except the median portion, ovate, acuminate, 3 to 4 mm. long, 1-nerved; second glume 5 to 6 mm. long, 3-nerved, glabrous, oblong ovate, abruptly subtruncate-acuminate. Flowering glumes 3, the first and second neuter, slightly pubescent, the first about 5 mm. long, 3-nerved, cleft at the apex for about $\frac{1}{4}$ its length, awned in the cleft, the awn scabrous, straight, about 1.2 mm. long; second flowering glume

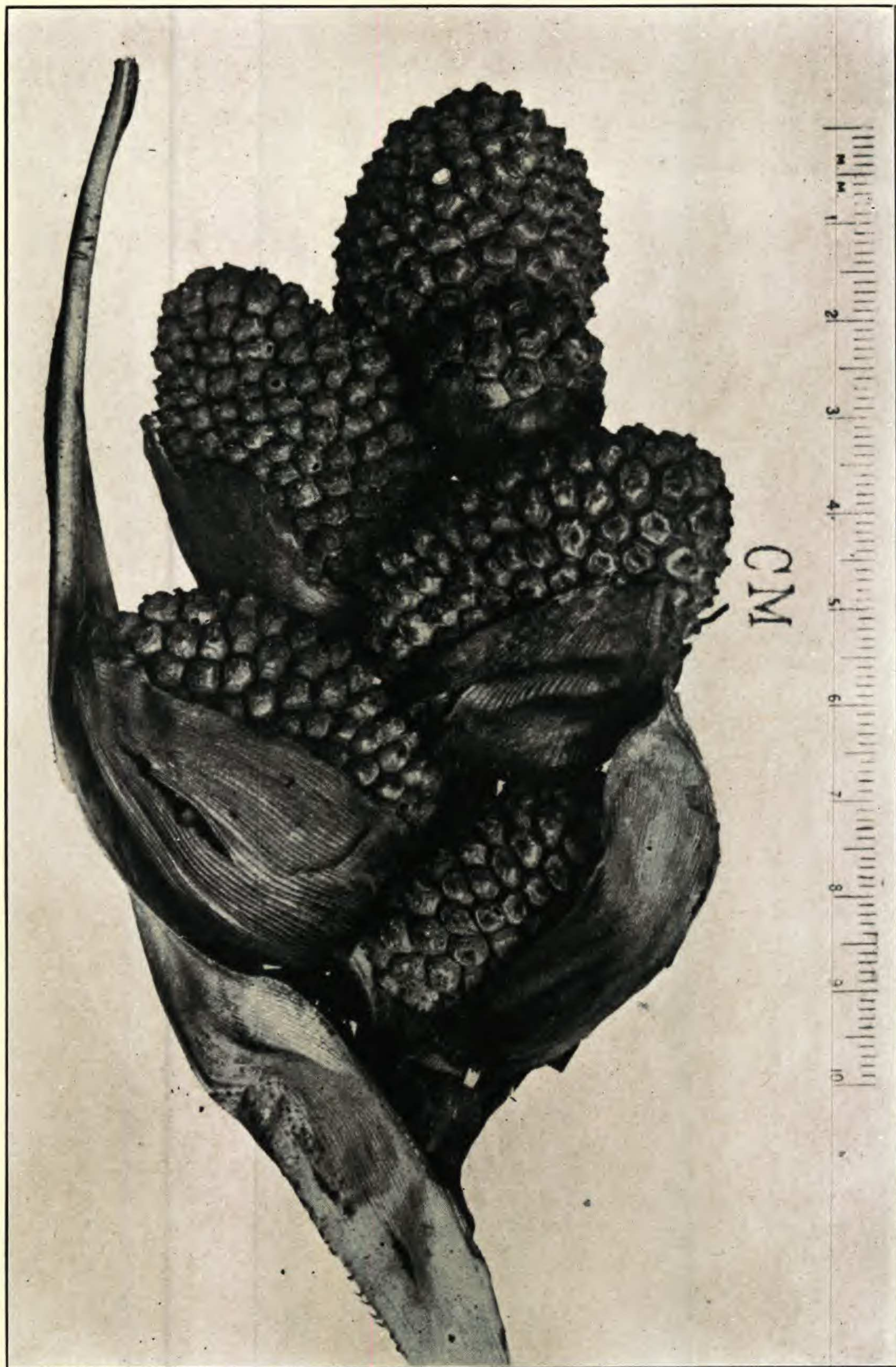


PLATE I. PANDANUS CLEMENTIS MERR.

about 4 mm. long, oblong, 1-nerved, cleft at the apex, awned from the back at the lower $\frac{1}{4}$, the awn straight, scabrous, about 6 mm. long; third flowering glume broadly-ovate, obtuse, hyaline, glabrous, nerveless or nearly so, hermaphrodite, inclosing a very narrow palea. Anthers narrowly oblong, about 2 mm. long.

LUZON, Province of Benguet, Pauai (4713 Merrill) November 8, 1905.

In the same locality and with the same associates as *Poa luzoniensis*, and like that species a very interesting northern type. Hackel, who has kindly examined specimens, states that this species is apparently related to the British Indian plant described by Hooker as *Hierochloa clarkei*, judging from the description. The present species differs from the well-known and widely distributed *Anthoxanthum odoratum* Linn., in its glabrous outer glumes and especially in the very short-awned first-flowering glume. It has the same characteristic odor and much the appearance of that species.

ARUNDINELLA Raddi.

Arundinella setosa Trin. Diss. 2 (1824) 63; Hook. f. Fl. Brit. Ind. 7 (1897) 70. *Danthonia luzoniensis* Steud. Syn. Pl. Gram. (1855) 245; Miq. Fl. Ind. Bat. 3 (1859) 427; Vidal, Phan. Cuming. Philip. (1885) 159; Rev. Pl. Vasc. Filip. (1886) 282; Ceron Cat. Pl. Herb. (1892) 184; F.-Vill. Nov. App. (1883) 319.

PHILIPPINES (1415 Cuming) cotype of *Danthonia luzoniensis* Steud. LUZON, Province of Benguet, Pauai to Baguio (4702 Merrill) November, 1905; Bued River (4271 Merrill) November, 1905.

British India to Cochin China, and southern China.

This species is enumerated here only to call attention to the reduction of *Danthonia luzoniensis* Steud. On receipt of a specimen of No. 1415 Cuming, from the British Museum, I found the number to be an *Arundinella* and not a *Danthonia*. A fragment was sent to Dr. Hackel, who pronounced it to be identical with *Arundinella setosa* Trin. The genus *Danthonia* can therefore be excluded from the Philippines.

CALAMAGROSTIS Adans.

Calamagrostis filifolia Merrill sp. nov. § *Deyeuxia*.

A densely tufted, erect grass 30 to 60 cm. high, with filiform leaves, and strict, densely flowered panicles. Culms glabrous, many in each tuft, erect, straight, glabrous; nodes dark, glabrous; sheaths, at least the lower ones, shorter than the internodes, the upper one often inclosing the immature panicles; ligule about 2 mm. long, subhyaline, irregularly cleft or lacerate; blades 10 to 20 cm. long, numerous at the base of the culms and on the innovations, erect, somewhat stiff, revolute, 1 mm. wide or less. Panicles at length exserted, pale green or slightly purplish, many flowered, the lower branches appressed, often 4 cm. long, forming a narrow somewhat spikelike, uninterrupted panicle. Empty glumes subequal, lanceolate, acuminate, about 6 mm. long, both 1-nerved, scabrous on the keel. Flowering glume lanceolate, 5 mm. long, minutely scabrous, 4-nerved, the nerves green, entire or very obscurely 2 to 3 toothed at the apex. Palea equaling the glume. Anthers 1.2 to 1.5 mm. long. Lodicules 1 mm. long. Callus hairs 1 mm. long or less; rhachilla about

1.2 mm. long, the hairs 2 mm. long or less. Awn of the flowering glume inserted at about the lower fourth, 7 mm. long, scabrid, somewhat geniculate and twisted below the geniculation.

LUZON, Province of Benguet, Mount Tonglon (4839 *Merrill*) November 12, 1905. In dry open soils at the summit of the mountain at about 2,250 m. Hackel states that this species is closely related only to *Calamagrostis nardifolia* (Griseb.) Hack. (*Agrostis nardifolia* Griseb.) of the Argentine Andes. A New Zealand species *Calamagrostis* (*Deyeuxia*) *setifolia* has similar leaves but quite other inflorescence and spikelets.

Hackel has suggested the name *Calamagrostis filifolia* forma *cleistogama* for specimens No. 4537 and 4715 *Merrill*, the former from Mount Data, Lepanto, and the latter from Pauai, Benguet, the specimens differing from typical *C. filifolia* in having the 0.5 mm. long anthers persisting with the ripening fruit within the closed glumes and palea and lodicules 0.7 mm. long.

If we exclude *Deyeuxia quadriseta* Benth., credited to the Philippines by F.-Villar, and undoubtedly not a Philippine plant, the identification apparently having been erroneous, then the above species is the first one of the genus to be reported from the Philippines, the genus in general being a northern one, or at least characteristic of the more temperate regions.

POA Linn.

***Poa luzoniensis* Merrill sp. nov.**

An erect perennial grass from long rootstocks, not at all tufted. Culms 30 to 40 cm. high, glabrous, smooth, geniculate below; nodes glabrous; sheaths equaling or shorter than the internodes, rather loose, the lower ones dry and brown; ligule short, truncate, cartilaginous; blades 8 to 14 cm. long, 1.5 to 2.5 mm. wide, flat, thin, glabrous, somewhat acuminate. Panicles lax, comparatively few flowered, slightly exserted, about 9 cm. long, the branches few, whorled, ascending or spreading-ascending, the longer ones 3 cm. or less, filiform, each bearing few spikelets. Spikelets about 3.5 mm. long, green or purplish, the pedicels 2 mm. long or less; first glume lanceolate, acuminate, about 2.1 mm. long, 1-nerved, slightly scabrous on the keel; second glume similar to the first but nearly 3 mm. long and 3-nerved. Flowering glumes 3, ovate, acute, 5-nerved, about 3 mm. long, slightly silky hairy on the keel below, otherwise glabrous, the paleas narrow, hyaline, about 2.5 mm. long, the rachilla glabrous.

LUZON, Province of Benguet, Pauai (4712 *Merrill*) November 8, 1905.

This species was found in a large, open, natural meadow along the borders of a cold stream at an altitude of about 2,100 m., being very rare in the locality, and associated with *Calamagrostis*, *Brachypodium*, *Bromus*, *Anthoxanthum luzoniense*, *Agrostis elmeri*, *Ranunculus* sp., *Viola* sp., various species of *Carex* and other northern types. Single, scattered specimens only were found, the rhizomes creeping rather extensively and generally rooting at the lower nodes. This decidedly northern type is an interesting addition to the known boreal element in the flora of northern Luzon, being the first native species of the genus to be reported from the Philippines. Dr. Hackel, to whom specimens were sent, states that it may be most closely related to the widely distributed *Poa pratensis* Linn.

Poa annua Linn. Sp. Pl. (1753) 68; F.-Vill. Nov. App. (1883) 322.

LUZON, Province of Benguet, Bued River (4288 Merrill) November 14, 1905, altitude 1,200 m.

This species was reported from the Philippines by F.-Villar, who states that he saw living specimens in Luzon and Panay. I have never seen specimens of this grass from regions at low elevations in the Philippines, and it is possible that F.-Villar's record was based on an erroneous identification. *Poa annua* was found along the new Benguet road near some of the construction camps, the seeds undoubtedly having been introduced in American hay, used for food for the horses and mules utilized in the construction work. It was well established, and will undoubtedly persist.

Among other weedy plants collected on the same trip which were certainly introduced by the same means are *Trifolium pratense* Linn., *T. repens* Linn., *Cerastium vulgatum* Linn., *Spergula arvensis* Linn., *Rumex acetosella* Linn., and *Rumex crispus* Linn. All of these plants were found in cultivated places or in waste lands near construction camps, and some of them will undoubtedly persist. With the exception of *Rumex acetosella* Linn., none of the above species have previously been reported from the Philippines. *Trifolium pratense* Linn., has also been collected in Mindanao, Camp Keithley (Mrs. Clemens), April, 1906.

FLAGELLARIACEÆ.

JOINVILLEA Gaudich.

Joinvillea malayana Ridley, Journ. Straights Branch Roy. As. Soc. 44 (1905) 199.

PALAWAN, Balsajan River (575 Foxworthy) March 3, 1906. In clearings in forests at an altitude of about 650 m. Malayan Peninsula and Borneo.

No species of this small genus has previously been discovered in the Philippines, the above specimen agreeing perfectly with authentic material of *Joinvillea malayana* in the Herbarium of this Bureau, received from the Botanic Garden, Singapore, collected at Perak. The species was described from material collected in Perak and Selangor, Malayan Peninsula, and Mount Matang, Sarawak, British North Borneo.

As noted by Ridley, this form is most closely related to one of the Hawaiian species, there being two of the genus known from Hawaii, and one from New Caledonia. For parallel distribution Ridley cites only the genus *Cyrtandra* of the *Gesneriaceæ*, which reaches its maximum development in the Sandwich Islands, extending to the Malayan Archipelago and Peninsula. For the Philippines a parallel case of distribution is represented by *Tetraplasandra philippinensis* Mer. of the *Araliaceæ* (see p. 219). In this very characteristic genus, one species is known from the Island of Palawan in the Philippines, one from New Guinea, one from Celebes, and six from the Hawaiian Islands. Another case is represented by the genus *Schistostege* Hillebr., of the *Polypodiaceæ*, of its three known species, one being from Hawaii and two from the Island of Mindanao, southern Philippines.⁸ Rolfe⁹ cites *Asplenium persicifolium* J. Sm., as being confined to the Philippines and Hawaii, but this species is apparently endemic in the Philippines, as Hillebrand¹⁰ considers the Hawaiian form distinct from *A. persicifolium*.

⁸ Copeland: *Philip. Journ. Sci.* 1 (1906), Suppl. 155.

⁹ Rolfe: *Journ. Linn. Soc. Bot.* 21 (1884), 397.

¹⁰ Hillebrand: *Fl. Hawaiian Isl.* (1888), 591.

LILIACEÆ.

ALETRIS Linn.

Aletris spicata (Thunb.) Franch. Journ. de Bot. 10 (1896) 199. *Hypoxis spicata* Thunb. Fl. Jap. (1825) 136. *Aletris japonica* (non Thunb.) Lamb. Trans. Linn. Soc. 10 (1811) 407; C. H. Wright in Forbes & Hemsl. Journ. Linn. Soc. Bot. 36 (1903) 76.

LUZON, Province of Benguet, Bugias (4685 *Merrill*) October 28, 1905; Pauai to Baguio (4801 *Merrill*) November 9, 1905.

Widely distributed in the highlands of Benguet Province, but not abundant, growing on dry grassy slopes in thin pine forests 1,200 to 2,000 m. An interesting addition to our knowledge of the northern element in the Philippine flora. Japan and the Korean Archipelago to Central and Southern China and Formosa.

DISPORUM Salisb.

Disporum pullum Salisb. Trans. Hort. Soc. 1 (1812) 331; Wright in Forbes & Hemsl. Journ. Linn. Soc. Bot. 36 (1904) 142.

LUZON, District of Lepanto, Mount Data (4857 *Merrill*) November, 1904. No species of the genus has previously been reported from the Archipelago. It is an interesting addition to the northern element in the Philippine flora. Not abundant in the mossy forest at an altitude of about 2,200 m., the specimens in fruit only. Japan to Formosa, China and temperate Himalaya, Java and Sumatra.

SALICACEÆ.

SALIX Linn.

Salix azaolana Blanco, Fl. Filip. ed. 2 (1845) 539; ed. 3, 3 (1879) 188; Merr. Govt. Lab. Publ. 27 (1905) 81. *Salix tetrasperma* Llanos (non Roxb.?) Mem. Ac. Cienc. Mad. (1858); Fl. Filip. ed. 3, 4 (1880) 106; F.-Vill. Nov. App. (1883) 210.

LUZON, Province of Rizal, Bosoboso (1987, 2139 *Ahern's collector*) November, December, 1904, the former with staminate flowers, the latter with mature fruits.

Blanco's description of this species is very short and imperfect, and a translation follows:

Salix (err. typ. *Salis*) **azaolana**, **Azaola's willow**. Leaves alternate, incised, serrate, attenuate at the apex, glabrous. Flowers dioecious. *Staminate flowers in aments. Calyx bifid. Stamens more than 12 (Azaola). Anthers globose. *Pistillate flowers. Calyx as in the male. Achene one.—*A tree, the trunk as thick as a man's body and which is found along the margins of rivers in Calumpit.* (Province of Bulacan, Luzon.) *Given to knowledge by P. Llanos.* *Tiaun.

Llanos, followed by F.-Villar, reduced this species to *Salix tetrasperma* Roxb., the latter adding that he had seen specimens sent to him by Llanos and also that he had seen living specimens at Quingua, Province of Bulacan, Luzon.

There is little doubt but that the specimens cited above represent Blanco's species, although his description is very imperfect; so far the only one of the genus known from the Philippines and one not previously collected except by Llanos and F.-Villar, no material of these early collections being preserved. Although Blanco cites Calumpit as the locality from which his material came, it seems probable that it was only sent to him from that town, having been collected at some other locality. During a recent trip up the Pampanga River, a stop of several days was made at Calumpit, and a careful search failed to

reveal the plant and I could find no natives who knew the word "Tiaun" as a plant name. However, as the country for many miles about Calumpit is under rather close cultivation, it is apparent that the original vegetation of the region has almost entirely been removed.

MORACEÆ.

FICUS Linn.

Ficus anomala Merrill sp. nov. § *Palaeomorphe*.

A tree about 10 m. high with elliptical-ovate, abruptly short acuminate scabrous leaves, the receptacles globose to obovoid, yellow, scabrous, in large fascicles on the trunk and larger branches. Branches brownish gray, glabrous, the branchlets also glabrous except at the slightly ciliate tips. Leaves submembranous, 10 to 16 cm. long, 6 to 11 cm. wide, slightly shining, harsh on both surfaces but not pubescent, the margins subentire or very obscurely undulate-crenate, the base broad, rounded, truncate or somewhat cordate, often somewhat inequilateral, the basal nerves 5 to 7, the outer ones short; primary lateral nerves about 7 on each side of the midrib, prominent, the reticulations distinct, lax, subparallel; petioles 3 to 7 cm. long. Receptacles very numerous, often nearly concealing the trunk and larger branches, in usually large fascicles of short, stout, congested 1 to 2 cm. long branchlets, yellow when mature, scabrous, nearly 2 cm. in diameter when fresh, considerably smaller when dry, the pedicels ebracteolate, 1 to 2 cm. long. Male flowers numerous near the ostiole, monandrous and with a rudimentary ovary, the perianth segments 4, free, enclosing and exceeding the stamen, oblong, about 2 mm. long, slightly ciliate above. Filament stout, about 1 mm. long; anther elliptical-ovoid, 1 mm. long. Rudimentary ovary less than 1 mm. long. Gall flowers numerous, the perianth lobes 4, free, linear, blunt, ciliate above, much exceeding the ovary which is elliptical ovoid, 1.5 mm. long, the style less than 1 mm. long, lateral. Fertile female flowers not seen.

LUZON, Province of Rizal, Montalban (5075 Merrill), March 10, 1906. A tree about 10 m. high and 30 cm. in diameter growing along small streams in thickets at an altitude of about 40 m. Anomalous for the section *Palaeomorphe* in that the receptacles are not axillary but borne in large fascicles on the trunk and branches as in many species of the sections *Covellia* and *Neomorphe*.

PARATROPHIS Blume.

Paratrophis caudata Merrill sp. nov.

A small tree about 8 m. tall, the young branches puberulent or glabrous, green, slender. Leaves broadly oblong-lanceolate or oblong-oblan-ceolate, submembranous, glabrous, shining, the base obtuse, the apex abruptly caudate-acuminate, the acumen obtuse, above with scattered minute white glands, the margins irregularly crenate-serrate, 7 to 17 cm. long, 2 to 5.5 cm. wide; nerves 7 to 8 on both sides of the midrib, prominent beneath, anastomosing; petioles 1 to 2.5 mm. long. Staminate inflorescence axillary, solitary, spicate, amentiform, 4 to 6 cm. long,

white, densely many flowered, the rhachis puberulent with minute hairs. Perianth 4-parted, the segments oblong-ovate, obtuse, about 1.5 mm. long. Stamens 4; filaments inflexed in bud, exerted in anthesis, 2 to 3 mm. long; anthers about 1 mm. long. Pistillate inflorescence axillary, spicate, short, 1 to 1.5 cm. long, few (about 8) flowered, the rhachis puberulent. Perianth 4-parted, the segments imbricate, subequal, oblong-ovate, obtuse, 1.7 to 2 mm. long. Ovary sessile, oblong, exerted, 1-celled, glabrous; style 2 mm. long, bipartite for two-thirds its length.

MINDANAO, District of Davao (278 *DeVore & Hoover*), April, 1903. BASILAN (2446 *Hutchinson*) December, 1905. "Common in forests above 15 m." *Hutchinson*. Bagobo *Hulas*, in Basilan *Olis*.

A species characterized by its comparatively short inflorescence and caudate-acuminate leaves, the margins of which are entire below and more or less irregularly crenate-serrate above.

URTICACEÆ.

CHAMABAINIA Wight.

Chamabainia squamigera (Wall.) Wedd. in DC. Prodr. 16 (1869) 218. *C. cuspidata* Wight; Hook. f. Fl. Brit. Ind. 5 (1888) 580; C. H. Wright in Forbes & Hemsl. Journ. Linn. Soc. Bot. 26 (1899) 489.

LUZON, District of Lepanto, Mount Data (4556 *Merrill*) November 4, 1905. In the mossy forest at about 2,250 m. Western China to Northern India south to Ceylon.

An interesting case of geographical distribution, no species of the genus having previously been reported from the Philippines. So far as I am able to determine from descriptions alone, the Philippine form is not distinct from the Asiatic species to which it is here referred.

LORANTHACEÆ.

LORANTHUS Linn.

Loranthus ahernianus Merrill sp. nov. § *Dendrophthoe*.

Shrubby, branched, glabrous except the somewhat furfuraceous inflorescence. Branches glabrous, rugose, lenticellate, reddish brown when dry, rather slender. Leaves opposite, glabrous, coriaceous, pale when dry, dull, ovate to oblong ovate, the base rather broad, rounded or obtuse, the apex acuminate, 6 to 10 cm. long, 2.5 to 5 cm. wide, the midrib prominent, the lateral nerves very irregular, obscure, petioles 1 cm. long. Inflorescence of solitary, axillary, lateral and terminal racemose panicles 6 to 8 cm. long, rather many flowered, the axis and short branches furfuraceous, the 1.5 to 2 cm. long peduncles subtended by a whorl of small imbricated bracts, the branches mostly above the middle, about 5 mm. long, each usually three flowered, the middle flower sessile, the two lateral ones pediceled. Flowers slender, tubular, about 3.5 cm. long, yellow, slightly enlarged below and at the apex, the subtending bracts ovate, that of the sessile flower acuminate, 4 mm. long, those of the lateral pediceled flowers smaller and often acute, the pedicels of the lateral flowers 3 to 4

mm. long. Calyx cylindrical, 4 mm. long, glabrous, the limb extended somewhat beyond the ovary, truncate or obscurely 6-toothed. Corolla about 3 cm. long, glabrous, the lobes linear, united for the lower 0.5 cm., the filaments inserted at about the middle, 9 mm. long, inappendiculate; anthers linear oblong about 5 mm. long.

LUZON, Province of Rizal, Bosoboso (2140 *Ahern's collector*) December 15, 1904. A species apparently related to *Loranthus viridis* Merr., but differing in many characters.

Loranthus cauliflorus Merrill sp. nov. § *Stemmatophyllum*, *Arthrostemma*.

Shrubby, glabrous throughout, the flowers arranged along one side of the branches below the leaves on very short usually trianthous peduncles. Branches dark brown, terete, glabrous, lenticellate. Leaves opposite, coriaceous, 18 to 25 cm. long, 6 to 8 cm. wide, oblong-ovate to ovate-lanceolate, dull, minutely densely wrinkled when dry, the base acute, the apex acuminate; nerves about 5 on each side of the midrib, ascending; petioles stout, 2 to 2.5 cm. long. Flowers rather numerous, red, the peduncles stout, 2 mm. long or less, each bearing three, sometimes but two or one, sessile flowers, each flower subtended by a broadly ovate basal bract about 2.5 mm. long. Calyx cylindrical, 3 mm. long, the limb short, truncate. Petals 5, free, 2 to 2.4 cm. long, linear, 2 mm. wide below, free, narrowed above, the recurved portion above the insertion of the stamen about 8 mm. long. Anthers about 7 mm. long, sessile or subsessile.

MINDANAO, Lake Lanao, Camp Keithley (55 *Mrs. Clemens*) January, 1906. A very characteristic species, at once recognizable by its peculiar inflorescence, the flowers being borne along one side of the branches below the leaves.

Loranthus clementis Merrill sp. nov. § *Dendrophthoe*.

Shrubby, glabrous throughout except the slightly puberulent flowers and inflorescence. Branches brownish gray, stout, terete, with numerous small lenticels. Leaves coriaceous, ovate to oblong-ovate, alternate, the base acute, the apex obtuse, dull when dry, 8 to 12 cm. long, 4 to 6.5 cm. wide, with two pairs of stout nerves from near the base of the leaf, the upper pair extending nearly to the apex, the reticulations lax. Flowers slender, somewhat curved, 2.5 to 3 cm. long, 2 to 5 racemosely disposed on each short peduncle, the peduncles numerous, fascicled in the axils of the leaves. Calyx cylindrical, nearly 3 mm. long, somewhat ferruginous puberulent, the limb produced above the ovary nearly 1 mm., 5-toothed, the basal bract narrowly ovate, acute, about 1.5 mm. long, the pedicel 1 to 2 mm. long. Corolla slender, somewhat curved, slightly inflated above, the tube long, red and yellow, grayish or brownish scurfy puberulent outside, the lobes 5, 10 to 12 mm. long, the reflexed portion above the insertion of the stamens linear, about 8 mm. long. Filaments 4 to 5 mm. long; anthers about 2 mm. long.

MINDANAO, Lake Lanao, Camp Keithley (*Mrs. Clemens*) March, 1906, altitude about 800 m.

Loranthus copelandi Merrill sp. nov. *Dendrothoë* § *Eudendrothoë*.

Glabrous except the inflorescence, with 11 to 18 cm. long lanceolate to oblong-lanceolate petioled leaves, and many flowered axillary fascicled racemes, the flowers red and yellow, about 4.5 cm. long. Branches brownish gray, glabrous, terete. Leaves subcoriaceous, glabrous, minutely wrinkled-rugose when dry, dull, 11 to 18 cm. long, 2.5 to 3.5 cm. wide, narrowed above to the blunt apex and below to the somewhat attenuate base, the midrib very stout, the lateral nerves 3 to 4 on each side of the midrib, long, ascending, the reticulations obscure; petioles stout, about 1 cm. long. Inflorescence slightly ferruginous pubescent, 3 to 5 racemes fascicled in each axil or in the axils of fallen leaves, 4 to 7 cm. long. Flowers slender, the buds slightly pubescent, becoming glabrous except the calyx, red below, yellow above, about 20 in each raceme. Pedicels about 1 mm. long, puberulent, the bract narrowly ovate, acute, 1.5 mm. long, puberulent. Calyx cylindrical, rather densely ferruginous puberulent, 3 mm. long, with 5 small teeth. Corolla slender, somewhat curved, slightly enlarged above, 4 to 4.5 cm. long, 5-lobed, the lobes linear, about 1 cm. long, becoming recurved. Anthers not narrowed below, 3 mm. long, apiculate-acuminate; filaments about 5 mm. long.

LUZON, Province of Benguet, Daklan to Kabayan (4407 Merrill) October 27, 1905. Parasitic on *Pittosporum pentandrum* (Blanco) Merr., in thickets at about 1,500 m. A species apparently closely related to *Loranthus curvatus* Blume, differing in its vegetative characters and fascicled racemes.

Loranthus mindanaensis Merrill sp. nov. § *Dendrothoë*.

Shrubby, glabrous throughout. Branches terete, glabrous, light gray, the younger branchlets brownish to olivaceous, rather slender. Leaves coriaceous, glabrous, dull, ovate to oblong-ovate, 8 to 12 cm. long, 4 to 6 cm. wide, the base broad, usually rounded, the apex blunt-acute, the midrib stout; lateral nerves irregular, 3 to 4 on each side of the midrib, ascending, not prominent, the reticulations lax; petioles stout, about 3 mm. long. Inflorescence axillary, of solitary 3 to 5 cm. long racemose panicles, the flowers in groups of threes at the ends of the very short branchlets, the branchlets racemosely disposed, opposite, 2 to 3 mm. long. Flowers sessile, glabrous, the bracts broadly ovate, about 1.5 mm. long, obtuse. Calyx cylindrical, about 3.5 mm. long, the limb truncate, entire, slightly exceeding the ovary. Corolla red, tubular, not enlarged below, nearly 2 cm. long, the lobes 6, linear, united for the lower 2 mm. Filaments very short, less than 1 mm. long, inappendiculate, the anthers linear, about 3 mm. long, the portion of the petals above the insertion of the stamen about 5 mm. long, reflexed in anthesis.

MINDANAO, District of Davao, Davao (341 Copeland) March, 1904, on *Theobroma cacao* L., and *Antidesma ghesambilla* Gaertn.; Mount Apo (285 DeVore & Hoover) May, 1903. A species related to *Loranthus secundiflorus* Merr., and *L. subalternifolius* Merr., differing in vegetative characters from both.

Loranthus mirabilis Van Huerck et Muell. Arg. in Act. Soc. Helv. Sci. Nat. 55 (1872) 47. *Stemmatophyllum cumingii* Van Tiegh. Bull. Soc. Bot. Fr. 41 (1894) 505. *Loranthus cumingianus* Engl. Nat. Pflanzenfam. Nachträge (1897) 128, non *L. cumingii* Engl. l. c.

PHILIPPINES, without locality (1966 *Cuming*) 1836-1840, in Herb. Bureau of Science. BASILAN (3447 *Hutchinson*) December, 1905, parasitic on trees along the seashore. MINDANAO, Davao (376 *Copeland*) March, 1904; Lake Lanao, Camp Keithley (*Mrs. Clemens*) March, 1906.

The oldest name for this species is *Loranthus mirabilis* Van Huerck et Muell. Arg., the description being published in 1872 as above cited. The name is recorded in the first supplement to Index Kewensis, but the citation to the original publication is not given, the reference being to Van Tieghem, Bull. Soc. Bot. Fr. 41 (1894) 547, in obs. Van Tieghem l. c. states that he found this number of Cuming's Philippine collection in the herbaria of Van Huerck, DeCandolle, and Boissier under the name *L. mirabilis*. He did not, however, find a reference to the place of publication. Both *Loranthus mirabilis* and *Stemmatophyllum cumingii* (= *Loranthus cumingianus*) were based on the same number of Cuming's Philippine collection cited above. It was by chance only that I found a reference to the original publication of *Loranthus mirabilis*, in reading over the list of Mueller's publications given by Briquet,¹¹ and I am indebted to Dr. William Trelease, director of the Missouri Botanical Garden, for a copy of the rather long description and discussion of the species, the original publication not being available in Manila.

Loranthus secundiflorus Merrill sp. nov. § *Dendrophthoe*.

Shrubby, less than 1 m. high, glabrous throughout except the minutely puberulent inflorescence. Branches slender, terete, smooth, somewhat enlarged and compressed below the nodes, olive brown when dry. Leaves opposite, lanceolate, coriaceous, shining, sessile, 8 to 10 cm. long, 2 to 3 cm. wide, paler beneath, the base obtuse or subacute, gradually narrowed above to the slightly acuminate apex; lateral nerves obscure, irregular, 5 to 7 on each side of the midrib, the reticulations lax. Inflorescence solitary, axillary, of 4 to 8 cm. long racemose panicles, the flowers secund, the axis and branchlets minutely puberulent, the branches of the inflorescence opposite, very short, about 3 mm. long, racemosely disposed, each with 2 or 3 sessile flowers at the apex, the bracts orbicular-ovate, obtuse, about 2 mm. long. Calyx cylindrical, 4.5 mm. long, minutely puberulent or subglabrous, the limb extending beyond the ovary and rather prominently 6-toothed. Corolla glabrous, cylindrical, not enlarged, about 2 cm. long, red, the lobes 2 mm. wide below, united for the lower 2 mm., the portion above the insertion of the stamens reflexed in anthesis, 5 to 6 mm. long. Anthers sessile, linear, inappendiculate, about 4.5 mm. long.

MINDANAO, Province of Surigao (237 *Bolster*) February 10, 1906. Parasitic on various trees in open lands at an altitude of about 15 m. above the sea. A species recognizable by its secund flowers and sessile anthers.

¹¹ Bull. Herb. Boiss. (1896), 4, 128.

Loranthus sessiliflorus Merrill sp. nov. § *Phoenicanthemum*.

Shrubby, entirely glabrous, with axillary solitary or fascicled spikes of small sessile flowers, the whole inflorescence glabrous, red. Branches dark reddish brown or nearly black when dry, terete. Leaves opposite, very coriaceous, broadly-ovate to suborbicular-ovate, dull and minutely wrinkled on both surfaces when dry, the apex broad, rounded or obtuse, rarely somewhat narrowed and acute, the base acute to subtruncate, 8 to 11 cm. long, 5 to 8 cm. wide, the nerves 4 to 5 on each side of the stout midrib, obscure; petioles stout, about 1 cm. long. Spikes 1 to 4 or 5 in each axil, usually 3, 4 to 7 cm. long, many flowered. Flowers red, sessile, about 7 mm. long, the subtending bract very thick, orbicular, nearly 1.5 mm. in diameter. Calyx glabrous, cylindrical, about 2 mm. long, the limb very slightly produced beyond the ovary, truncate. Petals 4, free to the base, linear, scarcely widened below, 5 mm. long, the upper half curved-reflexed from the insertion of the stamens. Filaments about 1 mm. long, slightly rugose-wrinkled near the insertion below, the anthers continuous, slightly wider than the filaments, oblong, 1.5 mm. long. Style glabrous, about 5 mm. long. Immature fruit small, ovoid.

LUZON, Province of Bataan, Mount Mariveles (1171 *Whitford*) March, 1905; Province of Benguet, Baguio (6057 *Elmer*) March, 1904. MINDORO, Baco River (4041 *Merrill*) March, 1905; (125 *McGregor*) March, 1905. Parasitic on various trees, sea level to an altitude of about 1,500 m.

Loranthus subalternifolius Merrill nom. nov. *Amylothea cumingii* Van Tiegh. Bull. Bot. Soc. France, 41 (1894) 264. *Loranthus cumingii* Engl. Nat. Pflanzenfam. Nachtr. (1897) 128, non *L. cumingianus* Engl. l. c.

Glabrous throughout. Branches light gray, terete, the branchlets often olivaceous, somewhat thickened and compressed below the nodes, smooth. Leaves coriaceous, subalternate, or the upper ones opposite, oblong-ovate, usually pale when dry, somewhat shining 8 to 13 cm. long, 4 to 5.5 cm. wide, usually gradually narrowed above to the acute, rarely slightly acuminate apex, and more abruptly narrowed below to the acute, often decurrent base; nerves about 6 on each side of the midrib, obscure; petioles 1 to 1.5 cm. long. Inflorescence of solitary, axillary, racemose panicles 4 to 7 cm. long, the branches short, opposite, spreading, racemosely disposed, about 3 mm. long, each bearing three sessile flowers at the apex, the bracts reniform, rounded, about 2 mm. long. Calyx cylindrical, about 5.5 mm. long, the limb strongly produced beyond the ovary, truncate, somewhat spreading. Corolla tubular, about 18 mm. long, golden yellow, somewhat inflated below, the lobes 6, linear, united for the lower 3 mm. Filaments very stout, about 2 mm. long; anthers linear, 2.5 mm. long, the portion of the petals above the insertion of the stamens thickened, nearly 6 mm. long, spreading or reflexed in anthesis.

PHILIPPINES (1969 *Cuming*) 1836-1840. LUZON, Province of Benguet, Sablan (6191 *Elmer*) April, 1904.

The above description is based on No. 6191 *Elmer*, my specimen of Cuming's plant a cotype of *Amylothea cumingii* Van Tiegh. = *Loranthus cumingii* Engl.,

being fragmentary, but sufficient I believe to show the identity of the two specimens. Van Tieghem's description being very short and imperfect, it has been thought well to publish a longer one here.

Loranthus viridis Merrill sp. nov. § *Dendrophthoe*.

Coarse, more or less branched, shrubby, glabrous throughout. Leaves opposite, coriaceous, usually pale or yellowish when dry, elliptical-ovate, ovate or even obovate, 6 to 11 cm. long, 4 to 6 cm. wide, rounded or acute at the apex, narrowed below to the acute, slightly decurrent base, shining above, dull beneath, the midrib stout, the lateral nerves obscure; petioles stout, 2 to 3 cm. long. Cymes 5 cm. long or less, few flowered, glabrous, solitary in the upper axils and terminal, the branches few, three or four, whorled at the summit of the 1 to 2.5 cm. long peduncles the branches spreading, about 1 cm. long, each branchlet with two or three flowers the pedicels about 2 mm. long, the bract subtending the flower small, orbicular-ovate, rounded. Flowers pale green, about 3.5 cm. long, the buds somewhat clavate at the tips. Calyx cylindrical, glabrous, 5 to 6 mm. long, the limb truncate, or very obscurely 6 toothed, slightly exceeding the ovary. Corolla slightly swollen below, the lobes 6, united for the lower 0.5 cm., 3 mm. wide below, gradually narrowed upward and 1 mm. wide above, the upper 1 cm. reflexed from the insertion of the stamens, much thickened and deeply channeled on the inner surface. Stamens 8 mm. long, the antheriferous portion narrow, about 3.5 mm. long, inappendiculate. Fruit fleshy, glabrous, ellipsoidal, about 12 mm. long.

LUZON, Province of Bataan, Mount Mariveles (816, 1814, 2938 *Borden*) June, September, 1904, and March, 1905. No. 1953 *Cuming*, Philippines, without locality, of which a fragmentary specimen exists in our herbarium, appears to belong here.

PHRYGILANTHUS Eichl.

Phrygilanthus obtusifolius Merrill sp. nov.

Glabrous throughout. Shrubby, much branched, about 1 m. long, the branches slender, brown or yellowish when dry, rigid, terete, the younger branches often somewhat compressed below the nodes, the nodes prominent. Leaves opposite, oblong-obovate, 3 to 6 cm. long, 1 to 2.5 cm. wide, the apex broad, rounded, gradually narrowed below to the cuneate base, coriaceous, dull, finely wrinkled on both surfaces when dry, the nerves, including the midrib, obsolete or nearly so; petioles 3 to 5 mm. long. Cymes glabrous, axillary and terminal, few, usually 2-flowered, solitary or two or three from each node, the peduncles slender, 1 to 2 cm. long, the pedicels 3 mm. long. Flowers white about 1 cm. long the bract small, rounded, about 1 mm. long. Calyx glabrous, cylindrical, truncate, 3 mm. long, the limb slightly exceeding the ovary. Petals 5, free, slightly enlarged, and 2 mm. wide below, narrowed above, the upper three-fifths curved-reflexed from the insertion of the stamens. Filaments 6 mm. long; anthers oblong, obtuse, versatile. Style glabrous, about 12 mm.

long, slender. Fruit yellowish or bright red, glabrous, fleshy, ovoid, 6 to 7 mm. long.

LUZON, Province of Bataan, Lamao River, Mount Mariveles (1081, 134 *Whitford*) February, 1905, May, 1904; (1813 *Borden*) September, 1904. Parasitic on *Eugenia* and other trees in forests at about 600 m. about the sea.

The first species of the genus to be found in the Philippines, the other known species being mostly confined to tropical America and Australia. In gross characters and habit strongly resembling *Loranthus nodosus* (Van Tiegh.) Engl. *Loranthus* sp. Merr. Phil. Journ. Sci. Suppl. 1 (1906) 50.

OLACACEÆ.

XIMENIA Linn.

Ximenia americana Linn. Sp. Pl. (1753) 1193; Miq. Fl. Ind. Bat. 1 (1855) 786; Masters in Hook. f. Fl. Brit. Ind. 1 (1875) 574; F.-Vill. Nov. App. (1883) 45.

BASILAN (3467 *Hutchinson*) December, 1905. Along the seashore, common, Moro, Pangungan. PALAWAN, Malinao River (3799 *Curran*) February, 1906.

This widely distributed species has previously been reported from the Philippines only by Fernandez-Villar, who states that he saw living specimens in many localities in the Province of Iloilo, Panay. So far as is known, the specimens cited above are the only Philippine ones extant. Tropical shores of America, Africa, Asia, and Malaya.

BERBERIDACEÆ.

MAHONIA Linn.

Mahonia nepalensis DC. Syst. 22 (1821) 21; Prodr. 1 (1824) 109; Fedde in Engl. Bot. Jahrb. 31 (1901) 120. *Berberis nepalensis* Spreng. Syst. Veg. 2 (1825) 120; Hook. f. Fl. Brit. Ind. 1 (1872) 109; Forbes & Hemsl. Journ. Linn. Soc. Bot. 23 (1886) 31.

LUZON, Province of Benguet, Baguio (5929 *Elmer*) March, 1904; (18 *Topping*) February, 1903. An interesting addition to our knowledge of the Asiatic element in the Philippine flora, the species having previously been known from the mountains of British India, Java, China, and Japan. No. 5929 *Elmer* has been examined by *Schneider*, who has recently monographed the genus *Berberis*,¹² and who verifies the above identification, although stating that in the absence of flowers the determination can not be absolutely certain. *Topping's* specimen is with flowers, and offers no characters by which I am able to distinguish the Philippine form from the above species.

ANONACEÆ.

UNONA Linn.

Unona merrittii Merrill sp. nov. § *Stenopetalon*.

A tree 20 to 25 m. high, glabrous throughout except the slightly puberulent flowers, the flowers greenish yellow, very fragrant, in fascicles from small tubercles on the branches below the leaves. Branches gray or grayish brown, quite glabrous throughout, striate when dry. Leaves

¹² *Bull. Herb. Boiss* (1905) II; 5.

oblong-lanceolate to elliptical-lanceolate, glabrous, subcoriaceous, shining above, pale and somewhat glaucous beneath, 10 to 14 cm. long, 2 to 3 cm. wide, the base acute, slightly inequilateral, the apex acute or obscurely sharp acuminate; nerves about 15 on each side of the midrib, indistinct, scarcely more prominent than the secondary nerves and lax reticulations; petioles glabrous, 5 mm. long. Flowers in fascicles of 4 to 10 or more on the branches below the leaves, the pedicels slender, glabrous, 1.5 to 2.5 cm. long. Calyx pubescent, the lobes orbicular-reniform, rounded, about 1.2 mm. long, wider than long. Petals 6, 2-seriate, equal, narrowly oblong blunt, not or but slightly narrowed above, puberulent, 1.6 to 2 cm. long, 4 mm. wide. Stamens about 1 mm. long, nearly as wide, the connective very shortly produced, truncate, concealing the cells. Ovaries many, glabrous, oblong, 1 mm. long, the ovules 2, on the ventral suture; stigma elliptical-ovoid, equaling the ovary in size. Fruit unknown.

MINDORO, Bongabong River (1447 *Whitford*) February 23, 1906 (type); (3712 *M. L. Merritt*) March 20, 1906. Delta of the river slightly above sea level, in forests. A species apparently related to *Unona desmantha* Hook. f. et Th., but quite distinct from that species. The flowers have the same color and odor as *Canangium odoratum* Baill.

MYRISTICACEÆ.

MYRISTICA Linn.

Myristica nivea Merrill sp. nov.

A tree about 12 m. high, glabrous. Branches terete, striate, glabrous except the innovations. Leaves chartaceous, oblong, the base rounded, the apex acute, glabrous above and somewhat shining, beneath glabrous, white, the midvein thick; nerves 14 to 15 on each side of the midrib, prominent, curved, brown, anastomosing near the margin, the secondary and tertiary nerves indistinct, the reticulations lax; petioles glabrous, sulcate, rugose when dry, 1 to 3 cm. long. Staminate inflorescence axillary, few flowered, the peduncle very short, the pedicels 3 mm. long, ferruginous pubescent, shorter than the flowers. Flowers subovoid, 7 to 9 mm. long, fasciculate, outside rufous-pubescent, inside glabrous, three parted for the upper one-fourth or one-fifth, the basal bract broadly ovate, obtuse, pubescent outside. Anthers about 10, 3 to 4 mm. long, narrowly linear, connate, glabrous, the stipe shorter than the column. Fruit solitary, short and thickly pediceled, broadly ovoid, subtruncate or rounded at the base, rounded at the apex, densely rufous pubescent or puberulent, 3 cm. long, the pericarp thick, the aril laciniate nearly to the base, the areolae narrow.

BASILAN (3454 *Hutchinson*) December, 1905 (Staminate flowers). MINDANAO, District of Zamboanga, San Ramon (*Copeland*) March, 1905 (fruit).

A species apparently most closely related to *Myristica mindanaensis* Warb., of the known Philippine species of this genus, differing from it in its fewer nerved leaves, fasciculate, much larger flowers, and other characters. *Myristica nivea*

is well characterized by the very white under surface of its leaves and very obscure, almost obsolete, lax, not parallel reticulations. It is known to the natives of Basilan as *Nyatnyat*.

LAURACEÆ.

ACTINODAPHNE Nees.

Actinodaphne philippinensis Merrill sp. nov.

A tree 15 to 20 m. high, quite glabrous except the inflorescence, with penninerved oblong-ovate to elliptical-ovate, alternate, subcoriaceous leaves which are somewhat glaucous beneath, and short, axillary, racemose inflorescence, the clusters of flowers pediceled. Branches brown, glabrous, the younger ones nearly black when dry. Leaves 8 to 15 cm. long, 4 to 8 cm. wide, shining above, the base rounded or acute, rarely slightly inequilateral, the apex acute or obscurely acuminate; nerves about 10 on each side of the midrib, prominent beneath, scarcely anastomosing, the ultimate reticulations dense; petioles 2.5 to 4 cm. long. Racemes axillary or from the axils of fallen leaves, rather densely ferruginous puberulent, the axis 1 cm. long or less, the peduncles 1 cm. long or less, puberulent, the bracts 6, orbicular ovate, concave, rounded, 6 to 7 mm. long, veined, glabrous or slightly pubescent. Flowers about 7 in each cluster, yellow, the perianth segments 6, sometimes 5, lanceolate, acute or acuminate, about 4 mm. long, 1.5 mm. wide, somewhat pilose, the tube about 1 mm. long. Stamens 9, all fertile, the anthers 4-locellate, all introrse; filaments about 4 mm. long, pilose below, the inner three glandular at the base. Pistillate flowers and fruits not seen.

MINDORO, Bongabong River (1476, 1416 *Whitford*; 3667 *Merritt*) February, March, 1906, the former with mature flowers, the latter two with buds only. In forests, delta of the Bongabong River, slightly above sea level, the first species of the genus to be reported from the Philippines. T., *Bakan*.

CRYPTOCARYA R. Br.

Cryptocarya acuminata Merrill sp. nov.

A tree 8 to 12 m. high with alternate ovate-lanceolate to oblong-lanceolate, rather slenderly sharply acuminate penninerved leaves which are paler and glaucous beneath, and axillary and terminal panicles which are densely ferruginous pubescent with short shining hairs. Branches light brown, rather densely ferruginous puberulent. Leaves subcoriaceous, shining and glabrous above, beneath glabrous or minutely puberulent on the midrib and nerves when young, the base rounded or acute, gradually narrowed above to the slender acuminate apex; nerves 8 to 10 on each side of the midrib, prominent beneath, ascending, parallel, scarcely anastomosing, the reticulations indistinct; petioles ferruginous puberulent, 1 to 1.5 cm. long. Panicles 5 to 7 cm. long, the peduncles 3 to 4 cm. long. Perianth segments 6, elliptical ovate to oblong ovate,

acute or obtuse, subequal, densely ferruginous puberulent outside, about 2 mm. long, about equaling the tube. Fertile stamens 9, the filaments short, somewhat pubescent, the anthers 2-locellate, those of the first and second series introrse, those of the third series extrorse, the fourth series of large stipitate, cordate, acuminate, staminodes. Ovary narrowly ovoid, glabrous, narrowed above into the style. Fruit black when dry, glabrous, or slightly puberulent, shining, subglobose, about 7 mm. in diameter.

MINDORO, Bongabong River (3673 *Merritt*; 1425 *Whitford*) March, February, 1906. In forests near the river slightly above sea level.

DEHAASIA Blume.

Dehaasia triandra Merrill sp. nov.

A tree 10 to 15 m. high, glabrous, only the three inner stamens fertile, the outer series reduced to staminodes. Branches light gray, glabrous. Leaves ovate-lanceolate to oblong-ovate, glabrous, subcoriaceous, somewhat shining on both surfaces, 10 to 20 cm. long, 4 to 7 cm. wide, narrowed below to the acute base and above to the sharply acuminate apex; nerves 7 to 9 on each side of the midrib, curved ascending, rather distinct beneath, the reticulations rather obscure, lax; petioles 1.5 to 2 cm. long, nearly black when dry. Panicles several from the young portions of each branchlet, glabrous, black when dry, 4 to 10 cm. long, few flowered, the peduncles 5 cm. long or less, the branches usually spreading, the flowers usually in threes at the tips of the branchlets. Flowers small, hermaphrodite. Calyx segments 6, deciduous, broadly ovate, acute, the inner three about 1.5 mm. long, the outer three somewhat smaller, slightly ciliate on the margins. Fertile stamens 3 only, in the inner row, the filaments pubescent, glandular at the base, the anthers 2-celled, extrorse, the stamens of the outer series reduced to flattened pubescent staminodes. Ovary narrowly ovoid, glabrous, about 1 mm. long, narrowed above into the 1 mm. long style. Fruit elliptical to elliptical oblong, glabrous, 3 to 3.5 cm. long, 1.5 to 2 cm. thick, the pedicel when fresh 5 cm. long or less, at least as thick as the mature fruit, fleshy, bright red, when dry 2 to 5 cm. long, less than 1 cm. thick, black.

MINDORO, Bongabong River (3751 *Merritt*; 1459 *Whitford*) March, February, 1906. MASBATE (3068 *Merrill*) August, 1903. LUZON, Province of Rizal (2000 *Ahern's collector*) November, 1904.

An anomalous species, differing from *Dehaasia* as described in its 3, not 9, fertile stamens, but so evident are the fruit characters that I have not hesitated to refer it to the above genus. In connection with this species I have carefully studied the description of *Salgada laurifolia* Blanco, referred by F.-Villar to *Eusideroxylon borneense*. The above specimens do not at all agree with Blanco's description, and to me it appears very doubtful if *Salgada* can be referred to *Eusideroxylon* with safety.

CRUCIFEREÆ.

LEPIDIUM Linn.

Lepidium ruderale Linn. Sp. Pl. (1753) 645; Hook. f. & Andr. in Hook. f. Fl. Brit. Ind. 1 (1872) 160.

LUZON, Province of Cagayan, Tuguegarao (188 *Merrill*) June 8, 1902. In dry, open, waste places, a weed, apparently introduced, but well established. Not previously reported from the Philippines. Europe, Asia, North America, and Australia.

CARDAMINE Linn.

Cardamine parviflora Linn. Sp. Pl. ed. 2 (1763) 914; DC. Prodr. 1 (1824) 152; Forbes & Hemsl. Journ. Linn. Soc. Bot. 23 (1886) 44.

LUZON, District of Lepanto, Balili (4609 *Merrill*) November 5, 1905, in a coffee plantation, damp shaded soil at about 1,600 m.; Province of Benguet, Baguio (5846 *Elmer*) March, 1904, in open damp soil along streams at about 1,400 m.

The first species of the genus to be reported from the Philippines, apparently native, and not distinguishable from the widely distributed *Cardamine parviflora* Linn., which extends from North America to Europe, northern Africa, and temperate Asia southward to Formosa.

ROSACEÆ.

RUBUS Linn.

Rubus copelandi Merrill sp. nov.

An ascending plant 1 to 1.8 m. high, with trifoliate leaves and solitary axillary white flowers, or sometimes two or more pedicels from the upper axils, the stems, petioles, and pedicels with usually slender, recurved spines, and slender spine-like capitellate hairs. Stems terete, greenish, or reddish, not at all pubescent, the spines and intermixed capitellate hairs rather numerous. Leaves alternate, trifoliate, the petioles about 3 cm. long, spiny and with capitellate stiff hairs, the stipules ovate-lanceolate to oblong ovate, acuminate, nearly 1 cm. long, foliaceous, capitellate hairy; leaflets ovate to elliptical-ovate, acuminate, firm, brittle when dry, glabrous on both surfaces, except the somewhat pubescent midrib above, paler beneath, 4 to 7 cm. long, 2 to 4 cm. wide, rather abruptly acuminate, the base broad, rounded, that of the lateral leaflets often inequilateral, the margins dentate or bidentate, the teeth small, mucronate acuminate; nerves about 10 on each side of the midrib, rather prominent, parallel, the midrib and often the lateral nerves with retrorse spines beneath, petiolules of the terminal leaflets about 1.5 cm. long, of the lateral ones 1 to 2 mm. Flowers white, 2.5 to 3 cm. in diameter, the pedicels 1 cm. long or less, spiny and with capitellate hairs. Calyx cinereous pubescent or puberulent, the lobes with few slender spines and capitellate hairs, ovate lanceolate, acuminate, often 1 cm. long, 5 mm. wide or less. Petals elliptical, rounded, somewhat narrowed below, about 12 mm. long, 8 mm. wide, distinctly veined. Stamens indefinite;

filaments 4 to 5 mm. long, glabrous; anthers 1 mm. Ovaries many, glabrous. Receptacle glabrous. Fruit red, ovoid about 1.5 cm. long, glabrous.

LUZON, Province of Benguet, Pauai (4810 *Merrill*) November 8, 1905. In thickets near border of the mossy forest at about 2,200 m. A species characterized by its trifoliate leaves, solitary large flowers, and peculiar capitellate, almost spine-like, hairs.

Rubus luzoniensis Merrill sp. nov.

A scandent shrub 5 to 6 m. high, with simple leaves, and terminal lax panicles, the branches, inflorescence, and under surface of the leaves densely pale ferruginous pubescent. Branches brown, terete, stiff, with scattered, small, usually somewhat retrorse spines, densely ferruginous pubescent. Leaves coriaceous, ovate to elliptical-ovate, 5 to 10 cm. long, 4 to 7 cm. wide, the base broad, truncate to slightly cordate, the apex acute or blunt, the margins rather finely dentate, not lobed, the upper surface dull or slightly shining, somewhat pilose on the midrib and nerves and also with few scattered long hairs on the lamina, becoming nearly glabrous, the under surface pale and very densely pubescent, the midrib and nerves also with scattered long hairs, the midrib with few scattered spines; nerves 6 to 7 on each side of the midrib, prominent, ascending, nearly straight, the reticulations prominent, subparallel; petioles 1 to 2.5 cm. long, densely pubescent and with small scattered spines. Inflorescence a terminal, rather lax panicle often 30 cm. long, the rhachis, branches and branchlets very densely ferruginous pubescent or pilose, and with scattered small spines, the branches irregular, distant, usually spreading, the lower ones often 15 cm. long, few flowered. Flowers white, short pediceled, about 1.6 cm. in diameter, the bracts ovate lanceolate, densely pubescent, 5 mm. long or less. Calyx very densely ferruginous pilose, the lobes ovate to oblong-ovate, acute, about 6 mm. long. Petals oblong obovate, gradually narrowed below, obtuse, 6 to 7 mm. long, 3 to 4 mm. wide. Stamens indefinite; filaments glabrous, about 5 mm. long; anthers 0.5 mm. long. Ovaries many, somewhat pilose on one side above or nearly glabrous, the receptacle pilose. Fruit unknown.

LUZON, District of Lepanto, Mount Data (4596 *Merrill*) November 4, 1905. In the mossy forest at about 2,250 m. Sterile specimens of another species were collected in the same locality, strongly resembling the above, but the leaves quite glabrous or at least only slightly pilose beneath.

LEGUMINOSÆ.

INDIGOFERA Linn.

Indigofera linifolia Retz. Obs. 4 (1779-1791) 29; Baker in Hook. f. Fl. Brit. Ind. 2 (1876) 92.

LUZON, Province of Benguet, Ambuklao to Daklan (4387 *Merrill*) October 25, 1905. On dry, rocky banks in open grass lands at an altitude of about 900 m. Not previously reported from the Philippines. Abyssinia to Afghanistan, British India, Malaya, and northern Australia.

MUCUNA Adans.

Mucuna acuminata Merrill sp. nov. § *Carpopogon*.

A long slender climber reaching a height of from 12 to 15 m. with slender glabrous branches, glabrous trifoliate leaves and short or long peduncled pendulous inflorescence, the flowers pale green or nearly white, 5 to 5.5 cm. long, the pods about 20 cm. long, rather strongly abruptly acuminate, without transverse plates and nearly glabrous, broadly winged down both sutures. Petioles 8 to 10 cm. long, glabrous or very slightly pubescent, the petiolules about 5 mm. long; leaflets ovate to elliptical ovate, 10 to 18 cm. long, 6 to 11 cm. wide, abruptly caudate-acuminate, the base rounded or subcordate, the terminal one regular, the lateral ones inequilateral glabrous, or when young with few appressed hairs; stipels subulate, nearly 5 mm. long. Peduncles slender, 20 to 60 cm. or more in length, the flowers paniculate at the apex, the branches 5 cm. long or less, the pedicels 1 to 1.5 cm. long, pubescent; bracts and bracteoles early deciduous. Calyx cup-shaped, 1 cm. long, about as broad, densely ferruginous and cinerous pubescent, but without stinging hairs, suboblique, the teeth short, broad. Keel and wings subequal, the former somewhat inflexed at the apex, the wings clawed, auricled at the base, pubescent on the margins below; standard about 2.5 cm. long, wider than long, retuse. Pod oblong, 18 to 21 cm. long, 5 to 5.5 cm. wide, 4 to 6 seeded, black when dry, shining, reticulate, but without plaits and stinging hairs, often somewhat pubescent below, the base acuminate, the apex abruptly apiculate-acuminate, the acumen 1.5 to 2 cm. long, the marginal wings about 1 cm. wide.

MINDORO, Baco River (4069 Merrill) March, 1905 (type); (220, 322 McGregor) April-May, 1905. In thickets along the river. Possibly No. 2955 Ahern's collector, from Bosoboso, Province of Rizal, Luzon, is the same, but the specimens are with immature flowers only.

A species closely related to *Mucuna gigantea* DC., differing from that species in its larger pods, which are without stinging hairs and which are rather long apiculate-acuminate, rather larger flowers and leaves, the leaflets also differing in shape and size. Differing from *M. longipedunculata* Merr., in its much smaller flowers.

Mucuna luzoniensis Merrill sp. nov. § *Stizolobium*.

Scandent, the trifoliate leaves 20 cm. long or less, the short peduncled racemes 15 to 40 cm. long, densely flowered, the flowers black-purple, about 3.5 cm. long, the pods flattened, scarcely turgid, not plaited or winged, straight, 9 cm. long, 1.5 cm. wide, densely covered with reddish-brown pungent stinging hairs. Petioles 8 to 10 cm. long, pubescent, the petiolules very densely pubescent, about 5 mm. long; terminal leaflet broadly ovate, rounded-truncate at the base, the apex rounded, apiculate, the lateral leaflets somewhat larger, 8 to 9 cm. long, 6 to 8 cm. wide, irregularly broadly truncate at the base, the apex rounded, apiculate,

beneath very densely grayish pubescent, above pubescent, especially on the nerves; nerves rather prominent, 6 to 7 pairs. Racemes densely cinereous pubescent and with brownish stinging hairs. Pedicels about 5 mm. long. Calyx about 1 cm. long, the teeth acute or acuminate, cinereous pubescent and with numerous long, brownish red, stinging hairs. Corolla black-purple, about 3.5 cm. long; standard about 2 cm. long; wings slightly shorter than the keel, the latter somewhat inflexed at the apex. Pod flat, straight, abruptly hooked at the apex, with about 5 seeds.

LUZON, Province of Union, Bauang (5999 *Elmer*) February, 1904, distributed as *Mucuna sericophylla* Perk., from which it differs in its apiculate, not retuse leaflets, somewhat smaller flowers, and much broader pods.

Mucuna lyonii Merrill sp. nov. § *Stizolobium*. *Negretia mitis* Blanco (non Beauv.) Fl. Filip. ed. 1 (1837) 588; ed. 2 (1845) 410; ed. 3, 2 (1878) 388; Naves l. c. t. 405 bis. *Mucuna nivea* F.-Vill. (non DC.) Nov. App. (1883) 63.

A scandent annual vine with somewhat pubescent, with apiculate leaflets, axillary racemes 30 to 40 cm. long, of very pale green, nearly white flowers 4 to 4.5 cm. long and narrowly oblong pods 10 to 12 cm. long, 2 cm. wide, densely covered with brown or gray hairs, not plaited or winged. Stems striate, pubescent with appressed grayish hairs. Leaves 25 to 40 cm. long, the leaflets three, membranous, the terminal one broadly ovate, regular, the apex acute or obtuse, the base subtruncate-acute, 11 to 14 cm. long, 9 to 11 cm. wide, the lateral leaflets 20 cm. long and 12 cm. wide, or less, oblique-truncate at the base, much broader on one side of the midrib than on the other, the apex apiculate, glabrous and shining above, beneath paler and with scattered appressed rather long grayish hairs; petioles 30 cm. long or less, somewhat pubescent; petiolules nearly 1 cm. long, rather densely pubescent; stipels subulate, about 2 mm. long. Racemes 30 to 40 cm. long, many flowered, more or less appressed grayish pubescent. Flowers in groups of threes, the internodes 1.5 to 2 cm. long, the pedicels about 8 mm. long. Calyx pale green, rather densely appressed grayish pubescent, the upper tooth triangular-ovate, acute, 7 to 8 mm. long, the lower lanceolate, acuminate, 1 cm. long, the two lateral ones lanceolate, acute or acuminate, 5 mm. long. Standard broadly elliptical-ovate, 2.5 cm. long, 2 cm. wide, obtuse, minutely retuse; wings 4 cm. long, 1.5 cm. wide, obtuse, auriculate at the base, claw short; keel equaling the wings, the upper 1 cm. inflexed, auricled at the base, the claw short. Ovary hirsute. Pods slightly turgid, somewhat curved, mucronate at the apex, slightly compressed between the seeds; seeds about 6.

Description from plants raised in Manila by W. S. Lyon of the Bureau of Agriculture, the seeds from Pampanga Province, LUZON, known to the Pampangans as *Sabual*. Blanco gives only the Spanish names *Habas* and *Garbanzos*.

PTEROCARPUS Linn.**Pterocarpus klemmei** Merrill sp. nov.

A large tree with glabrous shining leaves, terminal panicles and yellow flowers, the pods densely dark brown velvety pubescent when young and with many short soft spine-like processes in the central portion. Branches lenticellate, glabrous. Leaves alternate, about 20 cm. long, the rhachis slightly and sparingly pubescent with very short hairs; leaflets alternate, about 10, thinly coriaceous or submembranous, ovate to oblong-ovate, acuminate, the base broad, rounded, 5 to 7 cm. long, 3 to 4 cm. wide, glabrous and shining on both surfaces; nerves about 8 on each side of the midrib, the reticulations close, distinct; petiolules 2 to 3 mm. long. Panicles about 20 cm. long. Flowers yellow, about 1.5 cm. long. Calyx about 9 mm. long, the lobes short, acute or acuminate, pubescent with few scattered short hairs. Pods (immature) oblong-ovate, about 3 cm. long, thin, the stipe short, the pedicel about 1 cm. long, the periphery of the pod from stipe to style nearly straight or slightly convex, the style subulate, both surfaces densely dark brown velvety pubescent, shining, the wings without spine-like processes, but the pod proper with numerous soft spine-like processes 2 mm. long or less.

LUZON, Province of Cagayan, Palanan (4275 W. Klemme) June, 1906.

A species in vegetative and floral characters resembling *Pterocarpus indicus* Willd., and *P. echinatus* Pers., differing from both in its densely velvety young pods, from the former in having soft, spine-like processes on the pods and from the latter in having fewer and shorter, soft, spine-like processes instead of numerous stiff spines. The fourth species of the genus to be found in the Philippines, possibly a fifth being represented by No. 1002 Clark, Masbate, this specimen having densely velvety young pods without spine-like processes.

SINDORA Miq.

Sindora supa Merrill sp. nov. *Sindora wallichii* var. *intermedia* F.-Vill. (non Bak.) Nov. App. (1880) 71. *Sindora wallichii* Vidal (non Benth.) Sinopsis, Atlas (1883) 24. t. 43. f. C.; Rev. Pl. Vasc. Filip. (1886) 118; Ceron Cat. Pl. Herb. (1892) 70; Ahern Import. Philip. Woods (1901) 80.

A tree reaching a height of 25 m. and a diameter of 140 cm. with equally pinnate leaves, coriaceous glabrous leaflets and densely pubescent calyx lobes which have a few straight or curved spines on the upper half. Branches and branchlets glabrous. Leaves with a glabrous rhachis 6 to 7 cm. long; stipules foliaceous, 1 cm. long, acute, the base rounded or auriculate, glabrous or nearly so; leaflets 2, or mostly 3-jugate, the lower pair somewhat smaller than those above, oblong-ovate, 5 to 8 cm. long, 2.5 to 4 cm. wide, very coriaceous, entirely glabrous or with few scattered hairs on the under surface, especially on the midrib, the apex rounded, the base acute; nerves numerous, close, faint; petiolules 4 mm. long, glabrous. Flowers in rather dense axillary and terminal panicles 10 to 15 cm. long, the rhachis densely pubescent; bracts 4 mm. long, acute, pubescent; pedicels 2 mm. long, each with two lanceolate acute pubescent

bracteoles 4 mm. long. Calyx tube short, the lobes four, thick, 1 cm. long, densely pubescent within with appressed yellowish hairs, outside densely cinereous puberulous and in the upper half with few straight or curved pubescent spines about 3 mm. long. Petal 1, as long as the calyx lobes, densely appressed pubescent on the margins below. Staminal sheath and filaments hairy. Ovary hirsute. Pod broadly ovate, flattened, rounded at the base, the apical beak very small or nearly obsolete. Valves dehiscent, woody, uniformly armed on the outside with strong straight spines 5 mm. long or less and more or less densely ferruginous pubescent, becoming quite glabrous in age. Seeds usually four, ovate, hard, black, with an arillate funicle.

LUZON, Province of Tayabas, Pagbilao (2611 *Merrill*) May, 1903; Lagumanoc (2596 *Merrill*) March, 1903; (23 *Ware*) September, 1903; (910 *Whitford*) September, 1904; (201 *Merrill*) Decades Philip. Forest Flora, coll. *Hunt*, May, 1903; Atimonan (859 *Bath*) June, 1904; Guinayangan (860 *Bath*) June 1, 1904; (2021 *Merrill*) April, 1903; Baler (1010 *Merrill*) August, 1902.

A species related to, and previously identified with *Sindora wallichii* Benth. (*S. wallichiana* Benth.) of the Malayan Peninsula, differing from that species in its glabrous leaves, and larger pods. Dr. Prain, director of the Royal Gardens, Kew, has examined some of the material cited above and informs me that this species is not identical with Bentham's *S. wallichiana*. I have accordingly described the Philippine plant as a distinct species, using for the specific name the Tagalog name "Supa," by which this important timber tree is universally known in the Philippines.

The timber of this tree is hard and of a yellowish or reddish color, being used in naval and general constructions, and is frequently substituted for the more valuable "Ipil" wood (*Intsia bijuga* O. Ktze.). From 1900 to 1904 supa ranked fourteenth in amount received in the local lumber markets, with a total of 177,189 feet B. M., its average price for sawed lumber being \$81.50, United States currency per 1,000 feet B. M.

In addition to being a valuable timber tree, supa also yields considerable quantities of straw-colored or light-yellow, somewhat fragrant oil which burns with a clear flame. This has been discussed by Clover¹³ sub *Sindora wallichii*.

From a report submitted to the Chief of the Forestry Bureau by Mr. Kobbe, forester, the following extracts are taken:

"This oil (supa) is secured from the trunk of the living tree and not from the fruit or dead wood. The tree is usually hacked with bolo cuts as high as a man can reach and the oil runs down the channels so formed, into some vessel so placed as to catch the product. The oil seems to be a product of the entire woody portion of the tree and does not flow from any particular portion such as the sap wood only. If an auger hole be bored into the heart of a living tree, as much as 10 liters of oil is frequently obtained from the one hole. When the trees are slashed for gathering the oil, the first that exudes is set on fire, the heat causing a great increase in the flow of oil."

"The oil is not widely used. There is a demand for it for the manufacture of paint, especially for use on ships, varnish for sailboats, etc., and as an illuminating oil."

Tagalog, *Supa*, in Baler also *Manapo*.

¹³ *Phil. Journ. Science* (1906), 1, 192.

RUTACEÆ.

ATALANTIA Correa.

Atalantia linearis (Blanco). *Limonia linearis* Blanco, Fl. Filip. ed. 1 (1837) 357. *Limonia monophylla* Blanco, l. c. ed. 2 (1845) 252; ed. 3, 2 (1878) 103; Merrill, Govt. Lab. Publ. 27 (1905) 28, non Linn. *Atalantia monophylla* F.-Vill. Nov. App. (1880) 27, non Correa.

A shrub 1 to 3 m. high. Branches light gray, glabrous, the young branchlets greenish, pubescent or puberulent, terete. Leaves alternate, linear to narrowly linear-oblong or linear-lanceolate, glabrous, shining, coriaceous, 2 to 7 cm. long, 3 to 10 mm. wide, the base acute, the apex blunt, retuse, entire, the margins often somewhat recurved, the midrib prominent, the lateral nerves numerous, scarcely more distinct than the dense reticulations; petioles glabrous or pubescent, 3 mm. long or less. Inflorescence of terminal and axillary panicles, 3 to 5 cm. long, pubescent, the branches short, few flowered. Flowers white, short pediceled, about 6.5 mm. long. Calyx short, regularly 5-lobed, the lobes imbricate, broadly suborbicular, rounded, about 2 mm. long, 2.5 mm. wide, pubescent, the margins ciliate. Petals 5, free, oblong, the apex rounded, 6 to 6.5 mm. long, about 3 mm. wide, somewhat narrowed at the base. Stamens 5; filaments broad, 4 mm. long; anthers about 1.4 mm. long. Ovary glabrous, 3-celled, sessile, the disk shallow. Fruit glabrous, globose, white, glandular-punctate, about 8 mm. in diameter.

LUZON, Province of Rizal, Montalban (3392 *Ahern's collector*) November 28, 1905; (5044 *Merrill*) March 8, 1906, the former in flower, the latter with mature fruit. On cliffs and boulders at an altitude of about 40 m. along the river, frequently in situations submerged at high water associated especially with *Eugenia mimica* Merr., and sometimes with *Homonoya riparia* Lour. T., *Dayap na monti* (Blanco), *Aguhu* (*Ahern's collector*).

A species at once recognized by its very narrow leaves, which are retuse at the apex. Blanco's original description of this species is very short, his material being from the Island of Maricaban, Province of Batangas, Luzon, flowering in the month of July. In this description he states that the leaves are minutely serrate, probably from the fact that in specimens with recurved leaf margins, the slightly raised veins on the upper surface appear like minute teeth. The note following the description of the species in the first edition of the Flora de Filipinas is excluded in the second, this note referring to a similar form observed by Blanco in the Province of Bulacan, Luzon. I am of the opinion that the form here described is identical with Blanco's *Limonia linearis*, and accordingly his specific name is adopted and the species is redescribed under *Atalantia*.

Atalantia retusa Merrill sp. nov.

A shrub about 3 m. high, with oblong elliptical to elliptical-ovate, subcoriaceous, glabrous, strongly retuse leaves, racemose inflorescence and 5- to 7-merous flowers, the stamens 10 to 15, free, the ovary 1-celled. Branches brownish gray, glabrous, the branchlets green, glabrous. Leaves 5 to 9 cm. long, 2.5 to 4 cm. wide, shining, broad at both ends, scarcely narrowed above, the base rounded; nerves numerous, anastomosing;

petioles 8 mm. long or less, the spines short or wanting. Racemes in the upper axils, 1.5 cm. long in anthesis, densely flowered, puberulent. Calyx somewhat puberulent, the teeth 5 to 7, short, broad, regular, their margins ciliate, obtuse. Petals 5 to 7, glabrous, oblong, obtuse, 5 to 5.5 mm. long, 2.5 mm. wide. Stamens 10 to 15, unequal, the filaments free, 2.5 to 3.5 mm. long; anthers broadly ovate, slightly exceeding 1 mm. in length. Ovary oblong, glabrous, 1-celled, 1-ovuled; style much shorter than the ovary, including the stigma about 1 mm. long. Disk thickened, ring formed. Fruit (immature) ovoid, glabrous.

PALAWAN, Puerto Princesa (3609 *Curran*) January 30, 1906; (195 *Bermejós*) December, 1905. In old clearings and thickets, not common, at about 20 m. above sea level.

A species apparently related to *Atalantia disticha* (Blanco) Merr., differing from the latter in its leaves not being narrowed above, and in its flower characters. In some cases a very rudimentary second cell was observed in the ovary, showing that the species is perhaps sometimes with 2-celled ovaries. The very short style is another aberrant character, as well as the variable number of calyx teeth, petals, and stamens. In other species of the genus the ovary is from 2 to 5 celled, the petals and calyx teeth 3 to 5, and the style equaling or longer than the ovary.

SKIMMIA Thunb.

Skimmia japonica Thunb. Fl. Jap. (1784) 62; Skan in Curt. Bot. Mag. IV. 1 (1905) t. 8038.

LUZON, District of Lepanto, Mount Data (4552 *Merrill*) November, 1905.

This species is generally distributed, but not abundant, in the mossy forest above 2,200 m. on Mount Data, and along the high ridges between Loo and Pauai in Benguet Province, and will doubtless be found on most of the high mountains of northern Luzon. Vidal¹⁴ has reported an undetermined species of *Skimmia* from Lepanto, which is probably identical with the specimens here determined as *S. japonica*, while in a manuscript list of identifications of Loher's Philippine plants, made at Kew, No. 237 *Loher* is determined as *S. japonica*. From the material at hand I am unable to distinguish the Philippine form from *Skimmia japonica*, so well figured and described in Curtis's Botanical Magazine. The specimens available have immature flowers and mature fruits, the inflorescence being racemose and the flowers 5-merous. The discovery of *Skimmia* in the Philippines is a very interesting addition to the northern element in the Philippine flora, the present species being previously known only from Japan and Formosa.

POLYGALACEÆ.

POLYGALA Linn.

Polygala glomerata Lour. Fl. Cochinch. (1790) 426; DC. Prodr. 1 (1824) 326; Benth. Fl. Hongk. (1861) 44; A. W. Benn. in Hook. f. Fl. Brit. Ind. 1 (1872) 206; Forbes & Hemsl. Journ. Linn. Soc. Bot. 23 (1886) 60.

MINDANAO, Lake Lanao, Camp Keithley (36 *Mrs. Clemens*) February, 1906.

A species not previously reported from the Philippines, according to Bennett extending from the Eastern Himalayan region to the Eastern Archipelago and

¹⁴ Rev. Pl. Vasc. Filip. (1886), 75.

China, and according to Forbes and Hemsley from Southern China to the Eastern Himalayan region southward through the Malayan Peninsula. King,¹⁵ however, does not record the species from the Malayan Peninsula.

***Polygala luzoniensis* Merrill sp. nov.**

A perennial herb, prostrate, branched from the base, the branches slender, pubescent, 10 to 30 cm. long. Leaves oblong-ovate, acute, firm, 1 to 1.5 cm. long, 5 mm. wide or less, the base obtuse or rounded, rarely subacute, the petiole very short, margins somewhat recurved, the nerves 3 to 4 on each side of the midrib, not prominent, glabrous or slightly pubescent on the midrib on both surfaces. Flowers in short few flowered axillary racemes, the bracts small, caducous. Outer sepals subequal, 2 mm. long, oblong, obtuse, their margins with few hairs, the inner sepals petaloid, elliptical-oblong, hyaline, rounded, 5 mm. long, 3 mm. wide, 7-nerved from the base, the reticulations not anastomosing, glabrous, all persistent in fruit. Corolla about 5 mm. long, slightly pubescent below, the lateral petals connate for 2 mm., the free portions oblong, obtuse, 3 mm. long, 1 mm. wide. Keel calyptrate, quite entire, crested, the crest 1.5 mm. long, many cleft, purplish. Staminal tube, free portion, 1.5 mm. long, the filaments united throughout, the anthers sessile on the end of the tube, oblong, about 0.4 mm. long. Ovary glabrous; style curved, 2 mm. long, glabrous; stigma lateral. Fruit flattened, orbicular, 5 mm. in diameter, glabrous, membranous, reticulate-veined, somewhat emarginate, the wing 1 mm. wide. Seed obovoid, 2 mm. long, brown, uniformly but not densely villous, the strophiole with three hyaline appendages, one 2 mm. long, the other two about 1 mm. long.

LUZON, Province of Benguet, Baguio to Ambuklao (4368 *Merrill*) October, 1905. On dry banks in grass lands at an altitude of about 1,600 m.

***Polygala septemnervia* Merrill sp. nov.**

An erect or suberect much branched annual herb 20 to 30 cm. high, with small persistent bracts, and palmately 7-nerved, strongly reticulately veined orbicular-ovate to subelliptical inner sepals. Branches more or less pilose. Leaves lanceolate to oblong-lanceolate or linear-lanceolate, 2.5 to 6 cm. long, 3 to 7 mm. wide, membranous, the margins usually strongly revolute, apex and base acute, with few scattered hairs on the upper surface and margins, the lateral nerves obscure; petioles about 1 mm. long. Racemes axillary and terminal, few or many flowered, the flowers nodding, the axis slightly pubescent, the pedicels slender 2 to 3 mm. long, bracts persistent, lanceolate, acuminate, pubescent, about 1 mm. long. Sepals strongly reticulate-veined, the three outer ones somewhat unequal, oblong to elliptical ovate, obtuse, 2 to 2.5 mm. long, their margins minutely ciliate, the two inner ones petaloid, suborbicular ovate to subelliptical, rounded, 4 mm. long in anthesis, 5 to 7 mm. long in fruit, membranous, strongly palmately 7-nerved, the reticulations

¹⁵ Material for the Flora of the Malayan Peninsula (1889).

anastomosing, the margins slightly ciliate. Corolla about 4 mm. long, pale or purplish, the lateral lobes 2.3 mm. long, 1.3 mm. wide, obovate, obtuse, reticulate, the keel about 3 mm. long, crested, the crest purple, fimbriate, 1 to 1.3 mm. long. Filaments slender, about 1 mm. long; anthers oblong-obovoid, about 0.3 mm. long. Ovary sparingly ciliate, compressed; style glabrous, about 3 mm. long the stigma lateral. Capsule elliptical, flattened, membranous laxly reticulate veined, about 4.5 mm. long, with very narrow marginal wings which are sparingly ciliate. Seed elliptical or oblong elliptical, black, 3 mm. long, strophiolate, densely hirsute especially, above with, grayish or brownish hairs, the strophiole nearly white, about 0.8 mm. long, 3-appendiculate.

LUZON, Province of Benguet, Ambuklao to Daklan (4401 *Merrill*) October 25, 1905, in open grass lands at about 1,000 m.; Bued River (4263 *Merrill*) October 20, 1905, on open rock slopes at about 1,000 m.

SALOMONIA Lour.

Salomonium cylindrica Blume. *Epirhizanthe cylindrica* Blume; Miq. Fl. Ind. Bat. 1 (1859) 2: 128. t. 15.

LUZON, Province of Benguet, Sablan (6054 *Elmer*) April, 1904.

This species is here first credited to the Philippines, and is apparently rare, as Mr. Elmer found but three individuals, and no other collector has as yet detected it in the Philippines. It was previously known from Java and Sumatra. The Philippine specimens are evidently referable to Blume's species, rather than to the more widely distributed *Salomonium aphylla* Griff., which extends from China to Borneo, Malacca and Tenasserim.

EUPHORBIACEÆ.

BACCAUREA Lour.

Baccaurea gracilis Merrill sp. nov. § *Pierardia*.

A tree 6 to 10 m. high, quite glabrous throughout, with membranous oblong to oblong-lanceolate leaves, slender fascicled racemes of staminate flowers, the pistillate inflorescence short, racemose, both from the slender branches below the leaves and in the axils of the lower leaves. Branches light gray or brown, slender, terete, lenticellate, glabrous. Leaves shining on both surfaces, 10 to 16 cm. long, 3 to 5 cm. wide, short acuminate, the base acute, entire, glabrous; primary nerves 10 to 12 on each side of the midrib, spreading, distant, the secondary nerves and reticulations evident, rather lax; petioles rather stout, about 5 mm. long. Staminate inflorescence: Racemes slender, glabrous, 5 to 9 cm. long, 1 to 4 in the axils of the lower leaves or of fallen leaves, the flowers glomerate, about 10 in each glomerule, the glomerules scattered, bracts small, the pedicels very short. Sepals 5, imbricate, glabrous, orbicular, about 1.3 mm. long. Petals 0. Stamens 5, the filaments very short; anthers 1 mm. long. Rudimentary ovary present, glabrous, 2-cleft, the disk wanting. Pistillate inflorescence: Racemes 5 mm. long or less, sometimes reduced to fascicles in the axils of fallen leaves. Sepals 5. Ovary

glabrous, 3-celled, each cell 2-ovuled. Flowers one in each bract, subsessile. Fruit about 4 mm. long, somewhat flattened vertically, 6 mm. wide, obscurely 3-lobed, 3-celled, dehiscent, each cell 2-seeded, the pedicel in infrutescence slender, 1 to 1.5 cm. long.

PALAWAN, Puerto Princesa (218, 258 *Bermejós*) December, 1905; Panacan Point (3828 *Curran*) March, 1906. In forests near the seashore.

CLAOXYLON Juss.

Claoxylon elongatum Merrill sp. nov. § *Euclaoxylon*.

A tree about 10 m. high with oblong to oblong-lanceolate, acuminate leaves and slender elongated staminate inflorescence much exceeding the leaves. Branchlets slightly pubescent. Leaves membranous, rigid, 12 to 20 cm. long, 4 to 6 cm. wide, scabrous, the base acute, the apex rather slenderly acuminate, the margins distantly serrate, the upper surface glabrous, dull, scabrid with numerous densely disposed small white dots, the lower surface paler, slightly pubescent on the nerves, becoming nearly glabrous; lateral nerves prominent beneath, 5 to 6 on each side of the midrib, curved-ascending, the reticulations distinct; petioles 4 to 7 cm. long, slightly pubescent. Staminate inflorescence slender, axillary, solitary, 13 to 30 cm. long, many flowered, the axis rather densely hirsute pubescent. Flowers glomerate, white, sessile or short pediceled, 3 or 4 in the axil of each bract, the glomeruli scattered, the bracts densely pubescent, 1 to 1.5 mm. long. Sepals 3, oblong ovate, acute, glabrous or slightly ciliate on the margins, about 3 mm. long. Stamens about 25; filaments glabrous, about 1.5 mm. long; anther cells basifixed, about 0.5 mm. long. Disk glands scattered among the stamens, ovate to obovate, obtuse, densely ciliate above, about 0.8 mm. long. Pistillate flowers and fruits not seen.

LUZON, Province of Laguna, Mount Maquiling (5141 *Merrill*) March 17, 1906. In forests on steep slopes at about 150 m.

Claoxylon purpureum Merrill sp. nov. § *Euclaoxylon*.

A shrub about 5 m. high, with shining, few nerved, usually purplish, glabrous leaves and short, few flowered, axillary racemes, dioecious. Branches light gray, glabrous, the ultimate branchlets often slightly pubescent. Leaves oblong ovate to elliptical oblong, or obovate, submembranous, the apex short acuminate, often abruptly so, narrowed below to the acute base, the margins distantly sinuate crenate or dentate to subentire; nerves 5 to 6 on each side of the midrib, distant, prominent, curved-ascending, interarching, the reticulations prominent, lax; petioles 0.5 to 1.5 cm. long, glabrous or nearly so. Inflorescence slender, 4 cm. long or less, axillary, slightly pubescent. Female flowers few. Ovary 2-celled, each cell 1-ovuled; style cleft nearly to the base, the two arms recurved, about 2 mm. long. Male flowers: Sepals 3, valvate, elliptical, ovate, about 2 mm. long, acute. Petals 0. Stamens about 16; filaments about 1 mm. long; anther cells spreading or ascending, about 0.7 mm.

long; disk glands about 0.8 mm. long, among the filaments, slightly ciliate at the apex, the staminate flowers apparently but one in each bract. Fruit glabrous, purplish, 2-celled, each cell 1-seeded, about 6 mm. long.

LUZON, Province of Benguet, Suyoc to Pauai (4689 *Merrill*) November 7, 1905, staminate and pistillate flowers from different plants; Baguio (6307 *Elmer*) May, 1904; Mount Santo Tomas (6545, 6548 *Elmer*) June, 1904. Abundant in the mossy forests in the mountains and on high ridges above 2,000 m.

MACARANGA Thouars.

Macaranga dipterocarpifolia Merrill sp. nov. § *Mappa*.

A shrub or small tree reaching a height of about 7 m. Branches reddish brown, glabrous. Leaves ovate, glabrous, 13 to 20 cm. long, 8 to 12 cm. wide, subcoriaceous, glabrous, penninerved, the base broad, truncate, somewhat auriculate at the insertion of the petiole and with several large glands at the base on the upper surface, the margins irregularly repand-crenate, usually dull, the lower surface with numerous small glands, usually paler than the upper surface, 7 to 9 nerved from the base, the lower nerves short; lateral nerves prominent, spreading, subparallel, 10 to 13 on each side of the midrib, the lower pair (basal) sending stout branches toward the margins, the reticulations subparallel, distinct; petioles 5 to 10 cm. long, glabrous. Male inflorescence glabrous, paniculate, from the upper axils, 10 to 15 cm. long. Flowers numerous, yellowish, fasciculate in the axils of the bracts, the bracts linear, 5 to 7 mm. long or less, enlarged and with 1 to 3 or 4 large disk-like glands above, often somewhat enlarged below and with one or two lobes. Sepals 3, 1 to 1.2 mm. long, glabrous, elliptical-ovate, acute. Stamens 7 to 9; filaments 1 mm. long or less; anthers 4-celled. Pistillate flowers and fruit not seen.

LUZON, Province of Benguet, Sablan (6137 *Elmer*) April, 1904. Not common on dry open ridges.

A species resembling *Macaranga cumingii* Muell. Arg., but with much larger leaves and more numerous stamens, the shape and venation of the leaves resembling some species of *Dipterocarpus*, from which character the species is named. The same species has been collected (sterile) by *Whitford*, in the canyon of the Lamao River, Province of Bataan, Luzon, altitude 700 m.

CORIARIACEÆ.

CORIARIA Niss.

Coriaria intermedia Matsum. Bot. Mag. Tokyo 12 (1898) 62.

LUZON, Province of Benguet, Suyoc to Pauai (4800 *Merrill*) November 7, 1905. In ravines at about 2,000 m. Formosa.

Specimens of the above number were sent to Dr. J. Matsumura, of the Botanical Institute, Imperial University, Tokyo, Japan, for comparison with the type of his Formosan species, and after comparing the specimens, he expresses the opinion that the Luzon plant is identical with his *Coriaria intermedia*. Specimens collected in Benguet by Vidal, and recorded by him as "*C. sp.* (aff. *C. japonica*)

A. Gray)¹⁶ are undoubtedly referable to *Coriaria intermedia* Matsum. The thirteen known species of the genus have a peculiar geographical distribution, extending from the Mediterranean region to the mountains of British India, China, Japan and Formosa, and from New Guinea to New Zealand, Mexico, and South America. The presence of this Formosan species in Benguet adds another very characteristic species to the known northern element in the Philippine flora.

RHAMNACEÆ.

ZIZYPHUS Juss.

Zizyphus cumingiana Merrill sp. nov. *Zizyphus* aff. *Z. baclei* DC., Vidal, Phan. Cuming. Philip. (1885) 104.

A scandent shrub reaching a height of 10 m., with broadly-ovate to oblong-ovate, inequilateral, nearly glabrous, 3-nerved leaves, the lateral nerves branched, solitary spines and sessile or short-peduncled cymes about equaling the petioles. Branches dark brown, the older ones lenticellate, glabrous, the branchlets slender, more or less ferruginous pubescent, the spines stout, recurved, short. Leaves submembranous, shining, glabrous, or when young the nerves on both surfaces somewhat pubescent, the margins obscurely crenate or dentate, the teeth often apiculate, 4 to 6 cm. long, 2 to 3.5 cm. wide, the base rather strongly inequilateral, broad, rounded, sometimes subcordate, the apex acuminate, the acumen blunt, often obscurely apiculate; nerves 3, the lateral ones scarcely reaching the apex of the leaf and sending rather bold, curved-ascending branches toward the margin, the lower branches often simulating basal nerves, so that sometimes the leaves appear to be 4 or 5-nerved; petioles 6 to 8 mm. long, usually somewhat pubescent. Cymes about 8 mm. long, few flowered, slightly ferruginous-pubescent. Flowers greenish white, about 4 mm. in diameter, the pedicels 2 to 4 mm. long. Calyx glabrous or with very few hairs outside, the lobes ovate, acute, nearly 2 mm. long, keeled within. Petals about 1.5 mm. long, obovate-spatulate, cucullate, clawed. Disk glabrous, 10-crenate. Fruit obovoid, glabrous, black when dry, 1-celled, 1-seeded, 6 to 7 mm. long.

PHILIPPINES (453 *Cuming*) 1836-1840. LUZON, Province of Tayabas, Mount Banajao (994 *Whitford*) October, 1904. MINDORO, Bongabong River (3616 *Merritt*) February, 1906. PALAWAN (Paragua) Puerto Princesa (354 *Bermejós*) February, 1906; E-wi-ig River (690 *Merrill*) February, 1903. In forests and thickets from the sea level to 650 m. A species apparently related to *Zizyphus celtidifolius* DC., and *Z. timorensis* DC.

TILIACEÆ.

TRICHOSPERMUM Blume.

Trichospermum trivalvis Merrill sp. nov.

A small tree 6 to 8 m. high with oblong-ovate, cordate, often somewhat inequilateral serrate leaves and 3-valved triangular capsules. Branches nearly black when dry, glabrous, terete, the younger parts somewhat

¹⁶ Rev. Pl. Vasc. Filip. (1886), 102.

ferruginous pubescent. Leaves 10 to 20 cm. long, 5 to 12 cm. wide, submembranous, the base broad, cordate, usually somewhat inequilateral, the apex acuminate, the margins rather finely irregularly serrate, pubescent on the nerves and midrib above, paler and rather densely stellate pubescent beneath, the base 5-nerved, the lateral nerves prominent, 5 to 6 on each side of the midrib, ascending, the reticulations rather lax; petioles 5 to 10 mm. long, densely pubescent. Inflorescence of axillary, peduncled cymes 4 to 7 cm. long, the peduncles, branches, pedicels, and calyces densely uniformly ferruginous stellate pubescent, the peduncles 1.5 to 3 cm. long. Pedicels about 5 mm. long. Sepals free, oblong, acute, 7 to 8 mm. long, about 2.5 mm. wide, densely stellate pubescent outside, glabrous inside. Petals 5, about 6 mm. long, 1.5 to 2 mm. wide, acute, glabrous except at the thickened base which is rather densely pubescent. Stamens indefinite, inserted on the inside of a short densely villous disk; filaments slender, glabrous, 3 to 4 mm. long; anthers broad, about 0.5 mm. long. Ovary sessile, oblong, densely villous, 3-celled, each cell many ovuled. Style about 1.5 mm. long, expanded upward into the broad somewhat cleft stigma. Capsule nearly 1 cm. long, triangular, 3-valved, the style persistent, the valves pale and glabrous inside, densely ferruginous villous outside. Seeds many, 1.5 to 2 mm. long, compressed, the hairs of the arillus long.

LUZON, Province of Rizal, Antipolo (398 *Ahern's collector*) February, 1904; Bosoboso (1161 *Ahern's collector*) June, 1904. MINDORO, Bongabong River (1391 *Whitford*) January, 1906.

The first species of the genus to be reported from the Philippines, differing from all other described ones in its 3-valved capsules. Of the three other known species of the genus one is found in Java, one in the Fiji Islands, and one in Perak and the Nicobar Islands.

MALVACEÆ.

ABELMOSCHUS Medik.

Abelmoschus luzoniensis Merrill sp. nov. *A. moschatus* Perk. Frag. Fl. Philip. (1904) 111, in part.

An erect, herbaceous, somewhat branched annual, the vegetative portions densely velutinous pubescent and with scattered simple or stellately disposed bristle-like hairs, the bracteoles 5 to 7, ovate-lanceolate. Branches terete, the pubescence and bristles cinereous to fulvous, the latter few or many. Leaves 9 to 15 cm. long, cordate, deeply palmately 5-lobed, rather densely pubescent on both surfaces and with few or many stellately disposed bristle-like hairs, the outer lobes short, the others 7 to 13 cm. long, lanceolate, rather coarsely lyrate lobed, acuminate; petioles 8 cm. long or less, densely pubescent and with few bristles; stipules linear, about 7 mm. long. Flowers forming terminal racemes, yellow, the pedicels equaling the petioles, similarly pubescent. Bracteoles ovate lanceolate to oblong, 5 to 7, at length deciduous, 1 to 2.5 cm. long,

6 to 10 mm. wide, acute, densely pubescent outside and with few stellately disposed hairs inside. Calyx about 2 cm. long, cleft down one side, toothed at the apex, deciduous, densely pubescent outside, slightly so within. Corolla 6 cm. long or less, yellow. Capsule oblong ovoid, acute, 5-angled, 4 to 5 cm. long, about 2 cm. thick, the valves somewhat pubescent outside and beset with simple bristle-like hairs, inside slightly pilose. Seeds many, pubescent, about 3.5 mm. long.

LUZON, Province of Rizal, Tanay (2328 *Merrill*) May, 1903; Antipolo (1307 *Merrill*) February, 1903; Bosoboso (1864 *Ahern's collector*) September, 1904. Apparently a distinct species not at all closely related to *Abelmoschus moschatus* Moench., to which the first two numbers cited were referred by Perkins. Distinguished at once from the latter species by its broad bracteoles.

***Abelmoschus multilobatus* Merrill sp. nov.**

An erect branched herb 1 to 2 m. high, the vegetative portions beset with few or many simple bristle-like hairs each from a small papilla, otherwise glabrous, with deeply, narrowly palmately 7-lobed leaves, the lobes again coarsely irregularly lyrate lobed. Branches stout, terete, the bristles usually numerous. Leaves 12 to 20 cm. long, deeply cordate, the lobes narrow, lanceolate, acuminate, 9 to 17 cm. long, the lobules 3 cm. long or less, often coarsely irregularly toothed; petioles 18 cm. long or less, usually hispid; stipules linear, about 8 mm. long. Flowers yellow, their pedicels 10 cm. long or less. Bracteoles 6 to 8, lanceolate, about 1.5 cm. long, 5 mm. wide, acuminate, with few scattered hairs and bristles, becoming nearly glabrous. Calyx rather densely pubescent outside, somewhat pilose within, about 2 mm. long, deciduous, the apex rather coarsely toothed. Petals yellow, 6 to 8 cm. long. Ovary pubescent. Staminal column antheriferous throughout. Capsule (immature) ovoid, densely beset with simply disposed bristles, exceeding the bracteoles.

LUZON, Province of Bataan, Lamac River (1820, 1902 *Borden*) September, November, 1904; (6739 *Elmer*) November, 1904; Province of Union, Bauang (14 *Fenix*) October, 1905. All the above were distributed as *Abelmoschus moschatus* Moench., and the material from the Province of Bataan was so enumerated by the author.¹⁷ The species is, however, very distinct from *A. moschatus* Moench.

DILLENIACEÆ.

SAURAUIA Willd.

***Saurauia clementis* Merrill sp. nov.**

A shrub or small tree, the branches, leaves, and inflorescence with numerous linear, subulate chaffy bristles. Branches terete, brown, the bristles many, short and long intermixed. Leaves membranous, slightly shining, elliptical-obovate to oblong-obovate, 10 to 16 cm. long, 4 to 7 cm. wide, rather dark above, paler beneath, somewhat narrowed below to the acute, rarely obtuse base, more abruptly narrowed above to the short acuminate apex, both surfaces with numerous subulate bristles

¹⁷ *Phil. Journ. Science Suppl.* (1906), 1: 92.

which are more numerous beneath, especially on the midrib and nerves, the margins subentire or bristly toothed above; nerves 7 to 8 on each side of the midrib, rather prominent beneath; petioles about 1 cm. long, densely bristly. Inflorescence axillary, peduncled, cymose, few flowered, 4 to 8 cm. long, densely bristly throughout, the bracts lanceolate, acuminate, 8 to 9 mm. long, about 2 mm. wide. Sepals 5, imbricate, ovate, acute or acuminate, about 8 mm. long, the exposed outer surfaces thickly beset with subulate dark purple bristles about 3 mm. long, the outer three sepals coriaceous, the inner two membranous. Corolla about 10 mm. long, the lobes obovate, rounded, strongly irregularly retuse. Stamens 20; anthers 3 mm. long. Ovary glabrous, 3-celled; styles 3, 6 mm. long, united for the lower 1 mm.

MINDANAO, Lake Lanao, Camp Keithley (57 Mrs. Clemens) January, 1906.

Saurauia longistyla Merrill sp. nov.

A tree about 10 m. high, nearly glabrous throughout, with oblong leaves and fasciculate or solitary flowers on the branches below the leaves, the ovary 3-celled, the styles 3, united below. Branches light gray, glabrous, striate, the tips with few appressed, pale, triangular to narrowly ovate scales. Leaves 20 to 28 cm. long, 6 to 9 cm. wide, glabrous above, paler and quite glabrous beneath or with few scattered appressed scales, firm, shining, narrowed below to the acute base, the apex short acuminate, the margins above serrate or spinulose-serrate, entire below; nerves about 14 on each side of the midrib, prominent beneath, scarcely anastomosing, the reticulations subparallel, distinct; petioles 1 to 2.5 cm. long, with few appressed scales, becoming glabrous or nearly so. Flowers solitary or two or three in a fascicle in the axils of fallen leaves, white or pink, about 2 cm. in diameter, the pedicels 0.5 to 2 cm. long, with few appressed scales, the bracts about 8 mm. long, 3 mm. wide, acute or obtuse, oblong, glabrous. Sepals 5, glabrous, concave, elliptical to obovate, 8 to 10 mm. long, 6 to 8 mm. wide, rounded at the apex, subequal. Corolla lobes oblong-obovate, 10 mm. long, 6 mm. wide, glabrous, irregularly retuse at the apex. Stamens about 30, inserted on the base of the corolla; filaments about 4 mm. long, anthers 2 mm. long, 1.5 mm. thick. Ovary glabrous, 3-celled; styles 3, united for the lower 2 to 3 mm., the free portions 7 to 8 mm. long.

PALAWAN (Paragua), San Antonio Bay (835 Merrill) February 18, 1903. In forests at about 500 m.

Saurauia luzoniensis Merrill sp. nov.

A shrub, the branches, inflorescence, calyx lobes and petioles, minutely ferruginous pubescent and beset with setiform scales or scale-like hairs, the cymes axillary, solitary, 1 to 3 cm. long, few, 3 to 5-flowered, the ovary cells and styles 3. Branches brown, the older ones becoming glabrous. Leaves oblong to broadly oblong-oblongeolate, membranous, 10 to 17 cm. long, 3 to 6 cm. wide, somewhat shining when dry, paler beneath, the midrib, nerves and reticulations beneath with few scattered

appressed scale-like hairs, the upper surface quite glabrous or with few scales on the midrib, the margins spinulose serrate, often obscurely so, the apex short acuminate, narrowed below to the acute base; nerves about 13 on both sides of the midrib, distinct beneath, anastomosing, the reticulations netted, distinct; petioles 1 to 2 cm. long. Cymes few flowered, strigose, the bracts and bracteoles linear, acute or apiculate, 3 to 4 mm. long, 1 mm. wide. Flowers pink, about 13 mm. in diameter. Sepals 5, equal, oblong-ovate or oblong-obovate, 6 mm. long, 4 mm. wide, rounded at the apex, outside ferruginous pubescent or puberulent and beset with pale, strigose, awl-shaped, scale-like hairs 1 to 2 mm. long. Corolla glabrous, the lobes 5, oblong-ovate, irregularly retuse at the apex, about 7 mm. long, 4 to 5 mm. wide. Stamens 20; filaments more or less united, about 2.5 mm. long; anthers nearly 3 mm. long. Ovary minutely densely pubescent, 3-celled; styles 3, about 3 mm. long, slightly united at the base.

Luzon, Province of Rizal, Bosoboso (2902, 3101 *Ahern's collector*) March, May, 1905.

VIOLACEÆ.

RINOREA Aubl.

Rinorea palawanensis Merrill sp. nov. § *Prothesia*.

A shrub 2 to 4 m. high with membranous, nearly glabrous, oblong to obovate-oblong, acuminate leaves and few, axillary, fascicled or racemously disposed flowers, the anther cells with a short mucro, the connective with a large, ovate appendage. Branches gray, becoming glabrous, the younger ones somewhat pubescent. Leaves alternate, 15 to 27 cm. long, 6 to 9 cm. wide, irregularly crenate-dentate to subentire, shining, paler beneath, slightly pubescent on the nerves and midrib beneath, becoming quite glabrous, usually rather prominently acuminate, narrowed below to the rather abruptly acute, often somewhat inequilateral base; nerves 12 to 13 on each side of the midrib, distinct, distant 1.5 to 3 cm., anastomosing, the reticulations lax, distinct. Flowers fascicled or in short few flowered racemes, about 5 mm. long, greenish, the inflorescence pubescent, the pedicels 6 mm. long or less, the sepals and petals accrescent in fruit and persistent. Sepals narrowly ovate, acute, densely hirsute pubescent outside, less so within. Petals narrowly ovate, acute, 3 to 4 mm. long, somewhat pubescent outside. Stamens from the margin of the disk; anthers broadly ovate, 1.5 to 1.7 mm. long, each cell tipped with short mucro 0.3 mm. long or less, the connective with a broad, ovate, acute, subhyaline appendage from the middle, nearly 1.5 mm. long. Ovary somewhat ferruginous hirsute; style 2 mm. long, narrowed above. Capsule ovoid, 1 cm. long, obtusely obscurely 3-angled, glabrous or with few ferruginous hairs. Seeds few, glabrous, shining.

PALAWAN, Puerto Princesa (252 *Bermejós*) December, 1905; (3529 *Curran*) January, 1906. In forests.

LECYTHIDACEÆ.

BARRINGTONIA Forst.

Barringtonia curranii Merrill sp. nov. § *Stravidium*.

A tree 4 to 6 m. high, glabrous except the inflorescence, with large or very large oblanceolate leaves, elongated racemes, and 4-merous flowers which are about 7 cm. across when open, the fruits elliptical-obovoid, crowned by the calyx lobes, terete or very obscurely 4-angled, 7 cm. long, about 4 cm. thick. Branches thickened, light gray, the leaf scars rather large. Leaves alternate, crowded at the apices of the branchlets, subcoriaceous, rather pale when dry, shining, 20 to 60 cm. long, 6 to 12 cm. wide, the margins obscurely minutely but distantly toothed, the apex acuminate, gradually narrowed below to the attenuate base, the petiole stout, less than 1 cm. long; nerves 18 to 24 on each side of the midrib, very prominent, the reticulations evident. Racemes pendulous (1 m. long according to Bermejós) stout, ferruginous-puberulent. Flowers pink or red, sessile. Calyx tube about 8 mm. long, obscurely 4-angled, densely ferruginous mealy puberulent, the lobes 4, broadly ovate or orbicular-ovate, rounded, less than 1 cm. long, densely ferruginous mealy puberulent, the margins slightly ciliate. Petals 4, obovate, rounded, 3.5 cm. long, about 2 cm. wide. Stamens indefinite, the filaments 4 to 5 cm. long. Ovary 4-celled; style about 7 cm. long. Fruit wrinkled when dry, somewhat ferruginous puberulent, with a single large seed.

PALAWAN, near Puerto Princesa (3596 *Curran*) January 30, 1906; (225 *Bermejós*) December 14, 1905. In forests and old clearings 20 m. or more above the sea level.

Barringtonia revoluta Merrill sp. nov. § *Butonica*.

A tree about 12 m. high, quite glabrous, with oblong-lanceolate to oblong-oblanceolate entire leaves, the margins strongly revolute, elongated, slender, racemose inflorescence and 3-merous flowers, the calyx tube sharply 3-angled, the lobes and petals 3, and the ovary 3-celled. Branches slightly thickened, strongly rugose when dry, brown or grayish. Leaves alternate, crowded at the ends of the branchlets, subcoriaceous, pale and shining when dry, 15 to 24 cm. long, 3 to 6 cm. wide, the apex acute or slightly acuminate, gradually narrowed below to the attenuate base, the petiole proper stout, rugose, less than 1 cm. long; nerves about 14 on each side of the midrib, the reticulations rather lax, distinct. Racemes 40 to 50 cm. long or more, the flowers few, scattered, their pedicels about 1 cm. long. Flowers immature. Calyx tube narrowed below to the pedicel, sharply 3-angled, closed in bud, splitting into three broadly ovate, rounded lobes, which are sometimes minutely apiculate at the apex. Petals 3, free, elliptical ovate, rounded. Stamens indefinite; anthers 0.8 mm. long. Ovary 3-celled, each cell with 3 or 4 pendulous ovules from the upper inner angle. Fruit and mature flowers not seen.

PALAWAN, Iwahig Penal Settlement (3507 *Curran*) January 7, 1906. A tree not common along the river, slightly above sea level.

A very characteristic species, readily recognized by its entire strongly revolute leaves and 3-merous flowers.

COMBRETACEÆ.

COMBRETUM Linn.

Combretum sexalatatum Merrill sp. nov.

A scandent shrub, nearly glabrous, with opposite, oblong-ovate leaves, terminal and axillary panicles, the flowers crowded at the ends of the panicle branches, 4-merous flowers and prominently membranously 6-winged fruits, apparently dehiscent. Branches glabrous, brownish or grayish, terete, the ultimate branchlets somewhat pubescent. Leaves membranous or chartaceous, shining, the base acute or rounded, the apex short broadly acuminate, entire, 8 to 10 cm. long, 4 to 7 cm. wide, when very young more or less glandular-lepidote, becoming quite glabrous, or the nerve axils beneath barbellate; nerves 7 to 8 on each side of the midrib, somewhat prominent, the reticulations distinct; petioles 1.5 to 2 cm. long. Panicles 8 to 13 cm. long, the axis and branches densely pubescent, the lower branches subtended by leaves, the flowers densely racemosely disposed at the ends of the branchlets. Flowers yellow, obscurely glandular lepidote, the pedicels 4-angled, gradually merged into the calyx, the flower and pedicel about 12 mm. long, the buds acute. Calyx gradually wider upward, expanded above and villous at the throat within, the limb 4-lobed, the lobes reflexed, ovate, sharply acute, 3 mm. long. Petals 4, oblong, truncate, slightly exceeding 2 mm. in length. Stamens 8, exserted; filaments nearly 6 mm. long; anthers nearly 1 mm. long. Style 10 to 12 mm. long. Fruit apparently dehiscent, including the wings elliptical in outline, 3 to 5 cm. long, 2.5 to 4 cm. wide, the seed-bearing portion 1.3 cm. long or less, the back of each valve with a thin membranous wing about 1.5 cm. long, 0.5 mm. wide, the margins of the 3 valves expanded into membranous, reticulately veined wings quite surrounding each valve, 1.5 to 2 cm. wide, the free edges forming 6 longitudinal wings.

LUZON, Province of Rizal, Antipolo (3130 *Ahern's collector*) June, 1905 (flower); Bosoboso (1868, 3321 *Ahern's collector*) September, 1904, September, 1905 (fruit). The last number cited has much broader leaves and larger fruits than the others.

MYRTACEÆ.

EUGENIA Linn.

Eugenia mimica Merrill sp. nov. § *Jambosa*.

A glabrous shrub 1 to 3 m. high with subcoriaceous, lanceolate, oblanceolate or oblong-oblanceolate, acute or blunt leaves, terminal cymose panicles 6 cm. long or less, the flowers small, white, the buds narrowly

oblong-obovoid or club-shaped. Branches gray or brownish, terete, the branchlets sharply 4-angled. Leaves 4.5 to 9 cm. long, 1 to 1.5 cm. wide, shining above, paler and dull beneath, narrowed above to the acute or blunt apex and below to the narrow acute base, the margins somewhat recurved; primary nerves about 10 on each side of the midrib, distant, irregular, spreading, not prominent, anastomosing and forming a marginal nerve, the reticulations evident, netted; petioles 2 to 4 mm. long. Flowers usually in groups of threes at the tips of the branchlets of the inflorescence, the lower branches sometimes 3 to 4 cm. long, the flowers including the stamens 10 to 12 mm. long, narrow, the buds about 8 mm. long. Calyx truncate about 4 mm. in diameter at the mouth, cup-shaped, narrowed below into a 4 to 5 mm. long pseudostalk, glabrous. Petals 4, free, orbicular, 2.5 to 3 mm. in diameter, caducous. Stamens indefinite; filaments about 4 mm. long; anthers 0.3 mm. long. Fruit oblong-ovoid to ellipsoid, glabrous, dark purple when mature, about 1 cm. long, 7 to 8 mm. thick, crowned by the persistent calyx rim, with a single large seed, the pericarp thin, crustaceous when dry.

LUZON, Province of Rizal, Montalban (5034 *Merrill*) March 8, 1906; (3431 *Ahern's collector*) November, 1905.

A shrub growing on cliffs and boulders along the river at an altitude of about 40 m., associated with and simulating in habit *Atalantia linearis* (Blanco) Merr. Like *Atalantia linearis* and *Homonoya riparia*, this species is often found on ledges and boulders subject to overflow in times of high water, and like the former species is abundant along the river at Montalban in the limestone region, but is found only immediately bordering the stream. So close is the resemblance in habit and leaf characters between this species and *Atalantia linearis* that *Ahern's collector*, *Ramos*, brought in both under one number as being the same species.

MELASTOMATACEÆ.

ASTRONIA Blume.

***Astronia lagunensis* Merrill sp. nov.**

A shrub 4 to 6 m. high, nearly glabrous throughout except the inflorescence, with oblong-elliptical, acuminate, 7-nerved leaves, and furfuraceous inflorescence, the orbicular petals about 5 mm. in diameter. Branches rather stout, obscurely 4-angled, brown, glabrous. Leaves subcoriaceous, glabrous and green on both surfaces, not furfuraceous, 14 to 18 cm. long, 4 to 8 cm. wide, equally narrowed below to the acute base and above to the acuminate apex, the transverse nerves numerous, prominent beneath; petioles stout, 3 to 6 cm. long, when young slightly furfuraceous, becoming quite glabrous. Panicles pyramidal, 5 to 7 cm. long, 5 to 8 cm. wide below, the axis and opposite branches brown furfuraceous, the lower branches spreading, 4 cm. long or less, the upper ones gradually shorter. Flowers yellowish white and red. Calyx broadly funnel-shaped, about 4 mm. long, 5 to 6 mm. in diameter above, slightly furfuraceous, with 5 broad acute teeth less than 1 mm. long. Petals 5,

orbicular, 5 mm. in diameter. Stamens 10; filaments strap-shaped, 4 mm. long, 1 mm. wide; anthers dolabriform, 2 mm. long. Style about 6 mm. long.

LUZON, Province of Laguna, Mount Maquiling (5144 *Merrill*) March 17, 1906. Rather common in the mossy forest at an altitude of about 1,100 m. A species apparently related to *Astronia macrophylla* Blume, differing from that species in its smaller leaves and much larger flowers.

MEDINILLA Gaudich.

Medinilla bolsteri Merrill sp. nov.

An erect glabrous shrub, 2 to 3 m. high, with opposite, petioled, 5-nerved leaves, the transverse nerves evident, and fascicled or solitary lax cymes 10 to 15 cm. long from tubercles on the trunk, the flowers 5-merous. Branches light gray or greenish, glabrous, terete. Leaves membranous or chartaceous, elliptical to oblong-elliptical, short acuminate, the base acute, 13 to 20 cm. long, 7 to 9 cm. wide, 5-nerved, the exterior submarginal nerves from the base, the inner pair from the midrib 2 to 3 cm. above the base, the transverse nerves somewhat prominent. Peduncles to the cymes slender, 4 to 5 cm. long, the branches slender, opposite or whorled, divaricate, the flowers mostly subumbellately disposed at the tips of the branchlets, the pedicels 0.5 to 1 cm. long, ebracteolate. Flowers pink. Calyx cup-shaped, 4 mm. long, subtruncate or with 5 shallow teeth. Petals 5, obtuse, irregularly obliquely oblong obovate, 8 to 9 mm. long, 3 to 3.5 mm. wide. Stamens 10, subequal; filaments 4 mm. long; anthers 3 mm. long, acuminate. Style slender, glabrous, 7 mm. long.

LUZON, Province of Rizal, Bosoboso (3262 *Ahern's collector*), August 21, 1905 (type): Province of Cagayan, Tabug (173 *F. H. Bolster*) August 15, 1905. In shaded thickets by streams at about 250 m.

Medinilla dolichophylla Merrill sp. nov.

A glabrous shrub 3 to 5 m. high with 4-merous flowers, terminal and lateral long peduncled inflorescence, and lanceolate leaves 20 to 35 cm. long, the lateral longitudinal nerves faint. Branches quadrangular, the younger ones strongly 4-winged, the wings not undulate. Leaves membranous to subcoriaceous, 4 to 5.5 cm. wide, pale, shining, gradually narrowed above to the somewhat acuminate apex, the base acute, decurrent; midrib stout, the lateral longitudinal nerves four, scarcely more prominent than the distant transverse nerves, the reticulations lax; petioles about 1.5 cm. long. Cymes pendulous, terminal and from the branches below the leaves, the peduncles 15 to 20 cm. long, few flowered, ebracteolate. Calyx 4 to 5 mm. long, truncate, cylindrical or subcampanulate. Petals 4, white, irregularly obovate, narrowed below, about 14 mm. long, 8 mm. wide. Stamens 8, subequal; filaments 6 mm. long; anthers 6 to 7 mm. long, linear, tips purplish, base white, the middle portion yellow, the dorsal basal spur 1 mm. long, anteriorly 2-tuberculate. Style about

12 mm. long. Fruit ovoid, about 1 cm. long. Seeds oblong, rounded at the apex, about 1.5 mm. long.

LUZON, Province of Benguet, Baguio (4332 *Merrill*) October 22, 1905; (44 *Topping*) February, 1903.

A shrub characterized by its elongated, faintly nerved leaves and pendulous inflorescence, growing in damp shaded ravines along small streams at an altitude of about 1,500 m.

***Medinilla myriantha* Merrill sp. nov.**

A shrub 4 to 5 m. high, quite glabrous throughout, with opposite, 7 to 9-nerved sessile leaves and terminal many flowered panicles, the flowers 4-merous. Branches terete, rather slender, the younger ones obscurely angled, the nodes densely barbellate. Leaves subcoriaceous, elliptical ovate, 9 to 13 cm. long, 5.5 to 7 cm. wide, the apex abruptly short acuminate, the base cordate, often broadly so; nerves 7, prominent, sometimes with an additional pair of outer short nerves at the base. Panicles 10 to 20 cm. long, pink, many flowered, the branches verticillate, the lower ones about 9 cm. long, gradually shorter upwards, the bracts minute, subulate. Flowers numerous, pink. Calyx urceolate-cylindrical, 4 mm. long, truncate. Petals 4, oblique, about 8 mm. long. Stamens 8, subequal; filaments 4 mm. long; anthers nearly 5 mm. long, the spur less than 1 mm. long.

LUZON, Province of Laguna, Mount Maquiling (5129, 5133 *Merrill*) March 17, 1906. Abundant in the mossy forest 900 to 1,100 m. A species apparently related to *Medinilla intermedia* Blume, differing from that species in its more numerously nerved, sessile, cordate leaves and larger flowers.

***Medinilla teysmanni* Miq.** Ann. Mus. Bot. Lugd. Bat. 1 (1864) 217; Cogn. in DC. Monog. Phan. 7 (1891) 593.

MINDANAO, Camp Keithley, Lake Lanao (1 *Mrs. Clemens*) December, 1905. A species previously known only from Celebes and New Guinea, the specimen cited above differing from the species, as described, in its somewhat larger flowers but in no essential characters so far as I can detect.

PACHYCENTRIA Blume.

***Pachycentria formicaria* Merrill sp. nov.**

A glabrous or nearly glabrous epiphytic shrub 50 cm. high or less with 3-nerved leaves, the transverse nerves very obscure or obsolete, short petioles, and terminal corymbose inflorescence, the roots with oblong to ovoid thickened bulb-like swellings 1 to 3 cm. in diameter. Branches light gray to brownish, terete, glabrous or the younger branchlets minutely furfuraceous. Leaves coriaceous, oblong to elliptical or ovate oblong, pale when dry, dull, 6 to 12 cm. long, 1.5 to 4.5 cm. wide, entire, the base acute, the apex shortly acuminate, the lateral basal nerves slender, ascending, submarginal, not reaching the apex; petioles 3 to 10 mm. long. Corymbs about 5 cm. long, nearly as wide, many flowered, glabrous or nearly so, the bracteoles minute. Flowers pink. Calyx narrow, urceolate, about 4 mm. long, constricted above the ovary, the

limb nearly 2 mm. long, with 4 rounded teeth. Petals 4, ovate-lanceolate, about 5 mm. long, 2.2 mm. wide in the middle, narrowed below and to the acuminate apex. Stamens 8; filaments about 2 mm. long; anthers lanceolate, about 2 mm. long, rostrate, the basal dorsal spur about 0.5 mm. long. Ovary 4-celled; style 5 mm. long.

MINDANAO, Lake Lanao, Camp Keithley (433, 361 *Mrs. Clemens*) March, 1906; (3920 *Hutchinson*) March, 1906.

A typical Malayan genus, of which no species has previously been reported from the Philippines, the present species being well characterized by its thickened bulb-like roots, which are inhabited by colonies of ants, in this respect resembling the symbiosis found in the rubiaceous genera *Hydnophytum* and *Myrmecodia*.

HALORRHAGACEÆ.

HALORRHAGIS Forst.

In Schindler's recent monograph of this family¹⁸ no species of the genus *Halorrhagis* are credited to the Philippines. Schindler recognizes 59 species of *Halorrhagis*, of which 57 are confined to Australia and New Zealand, one to the Asiatic continent, and one extending over the entire range of the genus, from New Zealand and Australia to Japan, China, and Bengal. Three species of the genus are represented in our Philippine collections, one of which is apparently undescribed.

1. Calyx tube papillose-punctate, the ribs scabrous.
 2. Stamens 6 to 8; inflorescence paniculate; leaves lanceolate, about 1.5 cm. long..... (1) *H. scabra elongata*
 2. Stamens 4; inflorescence racemose; leaves elliptical-oblong, 1 cm. long or less..... (2) *H. philippinensis*
1. Calyx tube quite glabrous, not papillose-punctate, the ribs not scabrous (3) *H. micrantha*

- (1) **Halorrhagis scabra** (Koenig) Benth., var. **elongata** Schindler in Engler's *Pflanzenreich* 23 (1905) 28.

CULION (459 *Merrill*) December 13, 1902. In damp deserted rice lands near the sea level.

This variety has previously been known only from southern China, Hongkong, and Annam, although another variety of the same species is found in the Khasia Mountains, British India. The Philippine plant here referred to, *Halorrhagis scabra*, agrees very closely with the description and with specimens from Hongkong kindly supplied me by the Director of the Hongkong Botanic Garden.

- (2) **Halorrhagis philippinensis** Merrill sp. nov.

A scabrous herb 8 to 20 cm. high, erect or spreading, more or less branched from the base, with simple racemose inflorescence, the flowers solitary in the axils of the bracts, the calyx manifestly papillose-punctate, scabrous on the ribs but not parallel callose, the stamens four. Branches slender, appressed-pilose, 4-angled. Leaves elliptical oblong, coriaceous, sparingly pilose, 5 to 10 cm. long, 2.5 to 5 cm. wide, short petioled or sessile, mucronate acuminate or acute, the base acute, the margins

¹⁸ Engler's *Pflanzenreich* 23, 1905.

usually serrate, strongly cartilaginous. Racemes simple, the pedicels less than 1 mm. long; bracts foliaceous, ovate-lanceolate, 2 to 3 mm. long, sparingly scabrous-pilose; bracteoles 2, membranous, linear, sparingly pilose, 1 to 1.5 mm. long. Calyx 2 mm. long, the tube manifestly papillose-punctate, 8-ribbed, 1 mm. long, the ribs scabrous, the lobes 4, erect, ovate-lanceolate, acute, 1 mm. long, navicular, somewhat pilose on the keel. Stamens 4; anthers 1.2 mm. long. Fruit grayish, somewhat shining.

LUZON, Province of Benguet, Baguio to Ambuklao (4357 *Merrill*) October 24, 1905; District of Lepanto, Suyoc to Cervantes (4444 *Merrill*) October 30, 1905; Mount Data (4553 *Merrill*) November 4, 1904. On dry, open, grassy slopes in thin pine forests, 1,500 to 2,100 m.

(3) *Halorrhagis micrantha* (Thunb.) R. Br. Schindler l. c. 42.

NEGROS, Canlaon Volcano (*Banks*) March, 1902. MINDANAO, District of Davao, Mount Apo (1050 *Copeland*) April, 1904; (1436 *Copeland*) October, 1904, det. Rolfe. "Grows all over the summit but abundant only about pools, 2,600 to 3,000 m." *Copeland*.

A species not previously reported from the Philippines, extending from Bengal to Japan, Malaya, Australia, and New Zealand.

MYRIOPHYLLUM Linn.

Myriophyllum spicatum Linn. Schindler l. c. 90.

MINDANAO, Lake Lanao, Camp Keithley (450 *Mrs. Clemens*) April, 1906. Altitude about 800 m.

No species of the genus has previously been reported from the Philippines. Widely distributed in the tropical and temperate regions of the world, but not recorded by Schindler from the Malayan region.

ARALIACEÆ.

ACANTHOPANAX Decne. et Planch.

Acanthopanax trifoliatum (Linn.). *Zanthoxylum trifoliatum* Linn. Sp. Pl. (1753) 270. *Panax aculeatum* Ait. Hort. Kew. 3 (1789) 448. *Acanthopanax aculeatum* Seem. Journ. Bot. 5 (1867) 238; Forbes & Hemsl. Journ. Linn. Soc. Bot. 23 (1888) 229. *Aralia trifoliata* Meyen.

LUZON, Province of Benguet, Bugias (4661 *Merrill*) October 28, 1905. In thickets at an altitude of about 1,500 m.

An interesting addition to our knowledge of the relationship of the Philippine flora to that of the Asiatic continent. The above specimen agrees very closely with material of this species supplied me by the director of the Botanic Garden, Hongkong, with Formosan specimens received from the Imperial University, Tokyo; and with sterile specimens in Herb. Bureau of Science from a cultivated plant in the Botanical Garden at Buitenzorg, Java. The Philippine plant is, however, a scandent shrub, while in all the references to *Acanthopanax aculeatum* Seem., and synonyms of that species which I have been able to consult, the species is described as a shrub or small tree. However, I can not, from the descriptions and material available, find any other characters by which the Philippine plant can be distinguished, and have accordingly referred it to the above species, which extends from Japan and Formosa to China and Eastern India.

SCHEFFLERA Forst.

Schefflera luzoniensis Merrill sp. nov. § *Euschefflera*, *Heptapleurum*.

A scandent shrub, quite glabrous except the deciduously pubescent inflorescence, with 5-foliolate leaves, the leaflets caudate-acuminate, and terminal panicle branched from the base, the branches ascending, elongated, the flowers disposed in 3 to 5 flowered peduncled umbels. Branches light gray, glabrous. Petioles 6 to 8 cm. long, glabrous, slender; leaflets firm, shining, elliptical-lanceolate to narrowly obovate-lanceolate, abruptly long caudate-acuminate, the base acute, 4 to 6 cm. long, 1.5 to 2 cm. wide; primary nerves 6 to 7 on each side of the midrib, not prominent, the secondary nerves and reticulations nearly as evident, anastomosing and forming a marginal nerve, the leaf margin entire, recurved; petiolules 1.5 to 2 cm. long. Panicles 10 cm. long or less, branched from the base, the branches about 8 cm. long, more or less flocculose pubescent, becoming subglabrous, the bracts and bracteoles very caducous, the branchlets racemously disposed, 5 to 10 mm. long, each bearing 3 to 5 umbellately disposed flowers, the pedicels 3 to 4 mm. long. Calyx about 1.5 mm. long, truncate. Petals 5, oblong-ovate, 2 mm. long, acute, apex inflexed, free, falling separately. Stamens 5; filaments 2 mm. long; anthers broadly elliptical-ovate, about 0.8 mm. long. Ovary 5-celled; style 0. Fruit unknown.

LUZON, Province of Tayabas, Mount Banahao (928 *Whitford*) October 19, 1904. Scandent on trees in forests at about 1,100 m.

Schefflera microphylla Merrill sp. nov. § *Euschefflera*, *Heptapleurum*.

Subscandent, 2 to 3 m. high; glabrous throughout, with alternate, long petiolate, digitately 5 to 8-foliolate leaves, the leaflets lanceolate, acuminate, 5 cm. long or less, the flowers umbellately disposed in lax terminal panicles. Branches slender, terete, light gray or brownish. Petioles slender, 4 to 5 cm. long; leaflets entire, firm, shining, 3.5 to 5 cm. long, 4 to 6 mm. wide, gradually narrowed above to the long caudate-acuminate apex, the base acute; nerves few, not prominent; petiolules 5 to 8 mm. long. Panicles few branched from the base, 6 to 8 cm. long, the bracts and bracteoles wanting or very caducous, glabrous; branchlets spreading, few, slender, 1 to 1.5 cm. long, the flowers in 4 to 6 flowered umbels at the ends of the branchlets, the pedicels 4 to 6 mm. long. Calyx truncate or obscurely toothed, 1.5 mm. long or less. Petals 5, triangular-ovate, acute, 1.5 mm. long, adherent by their apices and falling as a whole. Stamens 5; filaments about 1 mm. long; anthers broadly ovate, nearly 1 mm. long. Ovary 5-celled; style not developed. Fruit elliptical-ovoid, glabrous, about 5 mm. long, 5-ridged.

LUZON, District of Lepanto, Mount Data (4605 *Merrill*) November, 1905. A subscandent shrub growing on rotten trunks and mossy trees in the wet forest at about 2,200 m., characterized by its small lanceolate leaflets.

TETRAPLASANDRA A. Gray.**Tetraplasandra philippinensis** Merrill sp. nov.

A tree 8 to 12 m. high, quite glabrous throughout, with 2 to 8 or more jugate leaves, the leaflets distantly obscurely crenate-serrate, and 7-merous flowers. Leaves alternate, the lower ones much larger than those near the apices of the branches, the latter often reduced to 20 cm. or less in length and 2 to 3 jugate, the former 80 cm. or more in length, 8 or more jugate, the common petiole stout, jointed. Leaflets oblong-ovate to oblong, glabrous and shining above, somewhat dull beneath, 10 to 16 cm. long, 4 to 8 cm. wide, the base rounded or acute, often inequilateral, the apex usually very abruptly short acuminate, the margins with few distant, scattered crenate-serrate, glandular teeth; nerves about 10 on each side of the midrib, irregular, the secondary nerves nearly as prominent; petiolules 1 to 1.5 cm. long. Flowers in peduncled umbels of 6 to 10 flowers each which are arranged in large racemose panicles, the peduncles about 2 cm. long in anthesis, 5 cm. long in infrutescence, whorled or alternate; pedicels 4 to 5 mm. long. Calyx cup-shaped or somewhat funnel-shaped, 2.5 to 3 mm. long, the limb slightly produced, truncate. Petals 7, lanceolate, acute, crested on the inside at the apex, about 3.5 mm. long, 1.2 mm. wide. Stamens about 28, several seriate, the inner much smaller; filaments 2 mm. long or less; anthers about 1 mm. long, the cells but slightly united. Ovary 7-celled; stigma sessile. Fruit ovoid, glabrous, about 8 mm. long, boldly 7 to 10 ridged.

PALAWAN, Casuarina Point (3809, 3844 *Curran*) March, 1906. Back of the beach and in forests along the seashore.

No species of the genus has previously been reported from the Philippines; of the 8 described species, one is from New Guinea, one from Celebes, and the remaining 6 are from the Hawaiian Islands. The species here described as new is apparently most closely related to the New Guinea species, *Tetraplasandra paucidens* Miq., but differs from the latter in many characters.

ERICACEÆ.**DIPLYCOSIA** Blume.**Diplycosia scandens** Merrill sp. nov.

A scandent more or less hispid pseudo-epiphytic shrub reaching a height of 4 m., with ovate or narrowly-ovate, short acuminate or acute leaves and fascicled flowers. Branches slender, gray or brown, the younger ones rather strongly beset with long brown appressed bristly hairs. Leaves coriaceous 3 to 4.5 cm. long, 1.5 to 2.5 cm. wide, the base rounded, entire, gradually narrowed above, glabrous on the upper surface or with very few hairs, beneath paler and with scattered bristly hairs; petioles about 3 mm. long, densely bristly hairy; nerves 2 on each side of the midrib, both below the middle of the leaf. Flowers

axillary, 3 to 6 in each axil, the pedicels pubescent, about 4 mm. long, 2-bracteolate at the apex, the bracteoles 1 mm. long, broader than long, ciliate. Calyx teeth broad, ovate, obtuse, about 1 mm. long, ciliate. Corolla white, about 5 mm. long, 3.5 mm. in diameter, the lobes broadly ovate, acute, reflexed, nearly 2 mm. long. Stamens 10; filaments 2 mm. long, not dilated below, glabrous; anthers about 1.2 mm. long, not horned. Ovary superior, glabrous, globose, 5-celled, cells many ovuled; style about 2.2 mm. long.

LUZON, District of Lepanto, Mount Data (4597 *Merrill*) November 4, 1905. Pseudo-epiphytic on mossy tree trunks in ravines, mossy forest at about 2,250 m. The first species of the genus to be reported from the Philippines, unless *Gaultheria* (*Diplycosia*) *luzonica* A. Gray, Proc. Am. Acad. 5 (1862) 324, proves to be a true *Diplycosia*. Gray's description is so short that I have been unable to locate his species, the type being from the collections made by members of the Wilke's U. S. Exploring Expedition from "Luzon, in the Majaijai Mountains" (Mount Banajao). Dr. B. L. Robinson informs me that the type is not in the Gray Herbarium. A second, apparently closely related but glabrous species, is represented by No. 5932 *Elmer*, Province of Benguet, Luzon, the specimens with fruit only.

RHODODENDRON Linn.

***Rhododendron nortoniae* Merrill sp. nov.**

An epiphytic shrub with lanceolate to oblong-lanceolate, coriaceous, acuminate leaves which are densely brown lepidote beneath, and terminal umbellate-like fascicles of tubular crimson flowers about 4.5 cm. long. Branches terete, brown, the branchlets densely covered with round, dark-brown scales. Leaves 9 to 15 cm. long, 1.5 to 3.5 cm. wide, narrowed below to the acute base and above to the rather long slender apex, entire, the margins slightly recurved, glabrous and shining above, densely covered with small round dark-brown scales beneath; lateral nerves 5 to 6 on each side of the midrib, distant, indistinct; petioles densely lepidote, stout, 1 cm. long or less. Umbels terminal, about 12 flowered, the bud bracts coriaceous, glabrous except the slightly pubescent margins, ovate to oblong-ovate, acute, 1 to 1.7 cm. long. Pedicels 1.3 cm. long, glabrous, the bracts oblong to spatulate, the bracteoles filiform, caducous. Calyx a disk about 3 mm. in diameter, obscurely 3-toothed, the teeth rounded, small. Corolla 4.5 cm. long, scarlet, the tube cylindrical, about 3.5 cm. long, scarcely inflated or enlarged above, slightly curved, 6 to 7 mm. in diameter, the limb 5-lobed, the lobes broadly ovate to obovate, rounded, 1 cm. long. Stamens 10; anthers oblong, 3.5 mm. long. Ovary narrowly oblong, the style elongated filiform, densely brown lepidote.

MINDANAO, Lake Lanao, Camp Keithley (500 *Mrs. Clemens*) April, 1906. Altitude about 800 m. Epiphytic on a large tree, associated with an epiphytic *Vaccinium*.

At the collector's request this distinct species is named in honor of Miss Norton, of the Pacific Grove (Calif.) Museum, the collector's interest in botanical work having been largely inspired by her.

VACCINIUM Linn.

Vaccinium microphyllum Blume. Bijdr. (1826) 851; Miq. Fl. Ind. Bat. 2 (1856) 1063.

MINDANAO, District of Davao, Mount Apo (1037, 1417 *Copeland*) April, October, 1904. A terrestrial shrub on the wind-swept summit 2,600 to 3,000 m., the shoots not ascending more than 10 cm. from the ground except in the more sheltered places.

Vaccinium microphyllum Blume, was described from a specimen in Reinwardt's herbarium from the mountains of Celebes, the original description being very short, but applying closely to the specimens cited above. A specimen of No. 1417 *Copeland* was sent to Dr. Treub, director of the Botanical Garden at Buitenzorg, Java, for verification of the above identification. Dr. Valetton, who examined the material, states that there is no authentic specimen of *Vaccinium microphyllum* in the herbarium at Buitenzorg, but that there is a sterile specimen collected by Teysmann in Ternate and identified as *V. microphyllum* by Scheffer, with which the Mount Apo plant agrees, except that the leaves of the latter are somewhat smaller than in the Ternate plant. The Mount Apo plant is apparently quite different from the species described by Beccari¹⁹ and Clarke²⁰ as *Diplycosia microphylla* (Blume) Becc., and by King and Gamble²¹ as *Vaccinium microphyllum* Blume, but I am of the opinion that Blume's description applies more closely to the Mount Apo plant than to the descriptions of Malayan Peninsula and Bornean material by the authors cited above. According to Valetton, the specimen reported from Celebes by Koorders²² as *Vaccinium microphyllum* "Reinw.," is not Blume's species, the flowers being racemose in Koorders's specimens.

PRIMULACEÆ.

LYSIMACHIA Linn.

Lysimachia microphylla Merrill sp. nov. § *Lerouxia*.

A small ascending uniformly and rather strongly hirsute-pubescent annual 5 cm. high or less, with opposite, petioled, glandular-punctate, obtuse or rounded leaves and short pediceled yellow flowers. Stems slender, densely hirsute-pubescent with pale spreading hairs, simple or slightly branched from the base. Leaves opposite, orbicular-ovate to ovate, sometimes subreniform-orbicular, 5 to 7 mm. long, often nearly as wide, the apex rounded or blunt, the base subtruncate to acute, glandular punctate, uniformly hirsute-pubescent on both surfaces; petioles 1.5 to 2 mm. long, pubescent. Flowers solitary in the upper axils, the pedicels pubescent, about 2 mm. long. Calyx cleft nearly to the base, the lobes linear-lanceolate, slightly acuminate, about 3.5 mm. long, 1 mm. wide, glandular punctate, strigose pubescent outside. Corolla yellow, 3.5 mm. long, glabrous, the tube less than 1 mm. long, the lobes elliptical-ovate to elliptical-oblong, obtuse or acute, glandular punctate. Filaments 1.5

¹⁹ *Malesia* (1878), 1, 212.

²⁰ *Hook. f. Fl. Brit. Ind.* (1882), 3, 456.

²¹ *Mat. Fl. Mal. Penin.* (1905), 3, 273.

²² *Meded. 's Lands Plant.* (1898), 19, 514.

mm. long; anthers blunt, 1 mm. long. Capsule 4 to 5 mm. long, ovoid, somewhat hirsute above, regularly dehiscing by 5 valves. Seeds many, triangular, rugose, brown, nearly 1 mm. long.

LUZON, Province of Benguet, Bugias (4668 *Merrill*) October 28, 1905; Daklan to Kabayan (4405 *Merrill*) October 27, 1905. On damp banks along the trail in open grass lands and in thin pine forests.

A species well characterized by its small leaves, which are glandular punctate with round spots.

SAPOTACEÆ.

SIDEROXYLON Linn.

Sideroxylon luzoniense Merrill sp. nov.

A small tree about 5 m. high with oblong-ovate to broadly oblong-lanceolate or elliptical-oblong, acuminate leaves, beneath shining and rather densely ferruginous-pubescent, and axillary fascicled flowers, the staminodes elongated, entire. Branches dark brown or nearly black, lenticellate, glabrous, the young parts rather densely cinerous and ferruginous pubescent. Leaves 7 to 9 cm. long, 2 to 4 cm. wide, coriaceous, glabrous above, the apex short acuminate or acute, gradually narrowed below to the acute base; nerves somewhat prominent beneath, 6 to 7 on each side of the midrib, the reticulations obscure; petioles densely pubescent, 1 to 1.5 cm. long. Flowers in axillary fascicles of from 2 to 5, mostly on the young branchlets, numerous, sessile. Calyx cup-shaped, 4 mm. long, densely ferruginous pubescent, 5-toothed, the teeth blunt, broad, less than 1 mm. long. Corolla 5 mm. long, glabrous, 5-lobed, lobes oblong-ovate, truncate, about 3.5 mm. long, 2 mm. wide below. Staminodes linear or linear-lanceolate, entire, blunt, 2.5 to 3 mm. long, less than 1 mm. wide. Filaments 2 mm. long; anthers broadly ovoid, 1.3 mm. long. Ovary ferruginous-pubescent, 5-celled.

LUZON, Province of Rizal, Antipolo (127 *F. W. Foxworthy*) January 16, 1906. In forest on Mount Kaysipot, at about 700 m.

OLEACEÆ.

JASMINUM Linn.

Jasminum populifolium Blume, Mus. Bot. Lugd. Bat. 1 (1850) 276; Miq. Fl. Ind. Bat. 2 (1856) 538; F.-Vill. Nov. App. (1883) 128; *J. luzoniense* Vidal, Phan. Cuming. Philip. (1885) 185; Rev. Pl. Vasc. Filip. (1886) 180; Ceron, Cat. Pl. Herb. (1892) 111; Usteri, Beitr. Ken. Philip. Veg. (1905) 120.

Blume cites no collector in the original diagnosis of his species, simply giving the locality "In insulis Philippinis." It seems probable that he had before him the same number of Cuming's plant that Vidal later described as *Jasminum luzoniense*. His description applies very closely to a specimen of No. 1029 *Cuming* in our herbarium, on which number Vidal's species was based. I have accordingly reduced *J. luzoniense* to the much earlier *J. populifolium*.

Jasminum triphyllum Merrill sp. nov. § *Trifoliata*.

A scandent shrub, glabrous or nearly so throughout, with opposite or subopposite, trifoliate leaves and axillary and terminal paniculate cymes. Branches slender, glabrous, the younger ones greenish-brown. Leaflets subcoriaceous, glabrous, ovate, slightly shining, short acuminate or merely acute, the base broad, rounded, the terminal one 6 to 9 cm. long, 3 to 4.5 cm. wide, the lateral ones somewhat smaller but similar in shape; nerves irregular, not prominent, about 6 on each side of the midrib, the base sub 5-nerved, the marginal pair often obscure; petioles 1.5 to 2 cm. long, the petiolule of the terminal leaflet 1.5 cm., of the lateral leaflets 1 cm. or less. Inflorescence equaling or exceeding the leaves, slightly pubescent, the peduncles 2 to 4 cm. long, the bracts small, ovate, the bracteoles minute. Flowers white. Calyx tube cup-shaped, about 2 mm. long, truncate or with very obscure teeth. Corolla slender, the tube 8 mm. long, slightly enlarged above, glabrous, the lobes 5, spreading, orbicular-ovate, obtuse, about 2.5 mm. in diameter. Filaments short; anthers oblong, slightly acuminate, about 2.3 mm. long. Stigma bifid, the lobes nearly 3 mm. long.

PALAWAN, Puerto Princesa (261 *Bermejós*) December, 1905. In forests.

A species apparently related to *Jasminum parviflorum* Decne., differing especially from the latter in its glabrous branches and orbicular-ovate, obtuse, not lanceolate, acuminate, corolla lobes.

GENTIANACEÆ.

COTYLANTHERA Blume.

Cotylanthera tenuis Blume. Bijd. 2 (1825) 707; Miq. Fl. Ind. Bat. 2 (1856) 735; Dunal, in DC. Prodr. 13 (1852) 674.

LUZON, Province of Laguna, Mount Maquilang (5149 *Merrill*) March 17, 1906. In forests at about 900 m.

The above identification is presumably correct, although the original and subsequent descriptions of the species, and the descriptions of *Eophylon lobbii* A. Gray, and *E. tenellum* A. Gray, the former at least being apparently a synonym of Blume's species, are all so short that absolute identification is impossible without comparison with the type material. The Philippine plant when fresh, is of a pale lavender color throughout, 4 to 6 cm. high, unbranched, or with at most one branch, with solitary flowers and 3 to 5 pairs of bracts.

GENTIANA Linn.

Gentiana apoensis Merrill sp. nov. § *Chondrophylla*.

A low, erect, often densely tufted, more or less branched perennial 2 cm. high or less, glabrous, the leaves all similar, distichous, imbricated. Leaves ovate-lanceolate, glabrous, acute or obscurely acuminate, 5 to 6 mm. long, about 2 mm. wide, sessile, crowded, the nerves obscure. Flowers solitary at the ends of the short branches. Calyx 5 mm. long including the teeth, the latter lanceolate, acuminate, apiculate, 2 to 2.5 mm. long. Corolla tubular, about 7 mm. long, 5-lobed, the lobes broadly

ovate, acute or obscurely acuminate, about 1.5 mm. long, the tube plaited, the teeth of the folds rounded or obtuse, entire or nearly so. Filaments 2 mm. long; anthers 0.9 mm. long. Capsule slightly exserted, stalked, the stalk about 5 mm. long, the capsule broadly ovoid, compressed, about 4 mm. long, the valves rather strongly 3-nerved.

MINDANAO, District of Davao, Mount Apo (1161, 1432 *Copeland*) April, October, 1904; (371 *DeVore & Hoover*) May, 1903. "Occasional in turf, but inconspicuous, not common," *Copeland*. Summit of the mountain at about 3,000 m.

No species of this genus have previously been reported from the Philippines.

Gentiana diversifolia Merrill sp. nov. § *Chondrophylla*.

An erect annual 2 to 3 cm. high or less, fasciculately branched, the stems glabrous, single. Lower leaves orbicular-ovate to orbicular-obovate, 10 to 12 mm. long, 10 mm. wide, acute, apiculate, narrowed below, glabrous, the margins very minutely denticulate, the leaves of the branches narrowly lanceolate, acuminate, apiculate, 6 to 8 mm. long, about 2 mm. wide, hyaline margined, the margins ciliate. Branches with one or two flowers. Calyx including the teeth about 6 mm. long, the teeth narrowly lanceolate, acuminate, apiculate, the margins ciliate, about 3 mm. long. Corolla tubular 7 to 8 mm. long, the teeth 5, narrowly ovate, blunt, their margins incurved, 2 mm. long or less, the tube plaited between the teeth, the teeth of the folds less than 1 mm. long, narrowly ovate, entire, acute. Filaments about 1.5 mm. long; anthers 1 mm. long. Capsule stalked, slightly exserted, the stalk broad, about 5 mm. long, the capsule about 4 mm. long, orbicular-ovate, margined, compressed, obtuse. Seed subglobose to ovoid, brown, minute, about 0.2 mm. in diameter.

LUZON, Province of Benguet, Kabayan (4443 *Merrill*) October 27, 1905. On damp, rocky banks, in open lands. Rare, altitude about 1,300 m.

Gentiana luzoniensis Merrill sp. nov. § *Chondrophylla*.

An erect simple or slightly branched annual 3 cm. high or less, the leaves similar, not imbricated, the stem and branches glandular. Leaves sessile, elliptical-ovate, acute or obtuse, glabrous, 6 mm. long or less, 3.5 mm. wide or less, the nerves few, obscure. Flowers white, solitary at the ends of the branches. Calyx about 4.5 mm. long including the teeth, the teeth lanceolate, acuminate, about 1.5 mm. long. Corolla 8 mm. long, tubular-campanulate, 5-lobed, the lobes ovate, acuminate, 1.5 to 2 mm. long, the tube plaited between the lobes, the teeth of the folds ovate, often slightly toothed, 1 mm. long or less. Filaments 4 mm. long; anthers 0.8 mm. long. Stigmas 1 to 1.5 mm. long, recurved. Capsule slightly exserted, stalked, narrowly obovoid, compressed, margined, about 5 mm. long. Seeds narrowly ovoid, acute, minutely reticulate, about 0.5 mm. long.

LUZON, District of Lepanto, Mount Data (4558 *Merrill*) November 4, 1905. On dry, open, grassy slopes in thin pine forests at about 2,100 m., rare.

GESNERIACEÆ.

CYRTANDRA Forst.

Cyrtandra villosissima Merrill sp. nov.

A shrub very densely ferruginous villous throughout with long soft hairs, the pubescence felted on the younger branches, inflorescence, petioles and under surface of the leaves. Branches brown, terete, the older ones less densely villous than the ultimate branches. Leaves thick, oblong-ovate to ovate-lanceolate, 11 to 20 cm. long, 3.5 to 8 cm. wide, narrowed above to the rather slender acuminate apex, and below to the acute or acuminate strongly inequilateral base, densely softly ferruginous villous throughout, paler beneath, the upper surface less densely pubescent than the lower, the margins dentate above, densely ciliate villous; nerves 12 to 14 on each side of the midrib; petioles densely felted villous, 4 cm. long or less. Cymes axillary, several flowered, about 3 cm. long, the bracts linear, 1 cm. long or less, densely felted villous like the rest of the inflorescence. Calyx lobes linear, 1.5 cm. long, 1 mm. wide, persistent, densely villous. Corolla about 18 mm. long, somewhat hirsute outside, tubular, subequally 5-lobed, the lobes orbicular-ovate, about 4 mm. long, pilose outside. Stamens 2, inserted at about the middle of the tube, included; filaments about 2 mm. long; anthers 2.5 mm. Ovary oblong, densely pilose; style pilose, included, 2-cleft; stigmas broadly elliptical-ovate. Disk cup-shaped, glabrous, 1 mm. long. Capsule oblong, about 1 cm. long, 4.5 mm. thick, hirsute. Seeds indefinite, oblong, about 0.3 mm. long, glabrous, brown.

MINDANAO, Lake Lanao, Camp Keithley (51 *Mrs. Clemens*) January, 1906. A very characteristic species, recognizable by its very dense, felted, ferruginous soft, villous pubescence, perhaps most closely related to *Cyrtandra mollis* DeVriese.

MONOPHYLLEA R. Br.

Monophyllea lowei C. B. Clarke in DC. Monog. Phan. 5 (1883) 183.

MINDANAO, District of Zamboanga, San Ramon (1565 *Copeland*) December 11, 1904. In rocky gorges in forests at about 160 m.

No species of this Malayan genus has previously been reported from the Philippines, the above specimens differing from *Monophyllea lowei* in its somewhat smaller leaves, but I am unable to separate it by other characters, the original description of Clarke's species being rather short. Borneo.

PARABOEIA Ridl.

Paraboeia luzoniensis Merrill sp. nov.

Stems stout, 5 to 7 cm. long, somewhat floccose, gray. Leaves many, crowded, long petioled, elliptical-ovate to elliptical-obovate, membranous, 7 to 11 cm. long, 4 to 7 cm. wide, subentire, the apex broad, rounded, rarely somewhat acute, the base acute or subtruncate, often oblique, the upper surface glabrous or nearly so, the lower surface paler, more or less densely floccose pubescent; nerves 6 to 8 on each side of the midrib,

ascending; petioles 2 to 7 cm. long, somewhat pubescent. Cymes many, axillary, long peduncled, lax, glabrous, the peduncles 12 cm. long or less, slender, dichotomously branched above, the bracts and bracteoles linear to lanceolate, 5 mm. long or less, the pedicels slender, 1 cm. long or less. Flowers pale blue, 1.5 cm. in diameter. Calyx 5-cleft nearly to the base, the lobes linear, 3 to 3.5 mm. long, less than 1 mm. wide, glabrous. Corolla 5-lobed, the lobes ovate, rounded, about 4 mm. long, the tube short, broad. Stamens 2; filaments 4 mm. long; anthers 2 mm. long, much broader than long. Ovary glabrous; style subcapitate. Capsule glabrous, linear, 2 to 2.5 cm. long, dehiscent into 4 straight valves. Seeds numerous, narrow, acute, brown, 0.4 mm. long.

LUZON, Province of Cavite, Maragondong (4178 Merrill) July 30, 1905. Abundant locally on cliffs in ravines 100 to 400 m.

I have followed Ridley²³ in retaining *Paraboca* as a genus distinct from *Didymocarpus* Clarke (*Roettlera* Vahl.).

TRICHOSPORUM Don.

Trichosporum littorale Merrill sp. nov.

A scandent epiphyte, glabrous except the slightly pubescent branches and inflorescence, with opposite, orbicular-ovate to elliptical-ovate leaves, 3 cm. long or less, and terminal flowers about 5 cm. long. Branches gray, slender, terete, somewhat pubescent. Leaves coriaceous, 2 to 3 cm. long, 1.5 to 2.5 cm. wide, entire, the base broad, rounded or slightly cordate, the apex acute or obtuse; nerves obsolete; petioles slightly pubescent, about 2 mm. long. Flowers purplish, several at the end of each branchlet, the pedicels 1.5 to 2 cm. long, slightly pubescent. Calyx nearly 3 cm. long, cylindrical, somewhat inflated, glabrous or slightly ciliate at the apex, 5-toothed, the teeth ovate, acute or obtuse, about 3 mm. long. Corolla about 5 cm. long, inflated at the base, then narrowed, and inflated again above. Capsule unknown.

MINDANAO, District of Davao, Malita (647 Copeland) March 26, 1904. Growing on tree trunks over the beach along the seashore, characterized by its short, broad, somewhat cordate leaves and relatively large calyx.

Trichosporum ovatum Merrill sp. nov.

A scandent plant, apparently an epiphyte, with opposite, glabrous, fleshy, coriaceous, ovate, acute leaves 3 cm. long or less, the flowers fascicled at the apices of the branches, 3 to 3.5 cm. long. Branches slender, gray, somewhat pubescent with weak scattered hairs, emitting rootlets. Leaves opposite, 1.5 to 3 cm. long, 1.5 to 2 cm. wide, very thick, fleshy when fresh, acute, the base broad, rounded, entire, the nerves obsolete; petioles about 2 mm. long, slightly ciliate. Flowers fascicled, 5 or 6 at the end of each branchlet, the pedicels, calyx, and corolla uniformly hirsute outside with scattered hairs, the pedicels slender, about 7 mm. long. Calyx glabrous inside, cylindrical, 1 cm. long, subequally 5-toothed,

²³ *Journ. Straits Branch R. A. Soc.* (1905), 43, 63.

the teeth short, broad, obtuse, 1.5 mm. long or less. Corolla apparently purple, tubular, curved, slightly inflated above, contracted somewhat at the throat, about 3 cm. long, the lobes ovate, rounded, 5 to 6 mm. long. Stamens 4, slightly exserted, the anthers 2.5 mm. long. Ovary glabrous; style slightly pubescent below the stigma. Fruit unknown.

MINDANAO, Lake Lanao, Camp Keithley (316 Mrs. Clemens) February, 1906. Altitude about 800 m. A species probably of the section *Holocalyx*.

***Trichosporum copelandi* Merrill sp. nov.**

A scandent epiphyte, glabrous except the inflorescence, with opposite, oblong leaves 5 to 7 cm. in length, and axillary and terminal inflorescence, the flowers quite the same as in *Trichosporum ovatum*. Branches slender, gray, glabrous. Leaves coriaceous, 1.5 to 2.5 cm. long, the base rounded or obtuse, the apex acute, pale, somewhat shining, the nerves obsolete; petioles rugose, 4 to 5 mm. long. Peduncles axillary and terminal, solitary or fascicled, somewhat pilose, two or more flowered. Flowers purple, in size, shape, and pubescence quite the same as in *Trichosporum ovatum*. Capsules linear, 10 cm. long. Seeds wanting.

MINDANAO, District of Zamboanga, San Ramon (1619 Copeland) February 5, 1905. An epiphytic vine in forests along the river at about 200 m. A species apparently closely related to the preceding, similar in floral characters, but differing in its much larger, very differently shaped leaves, longer petioles, and glabrous branches, the inflorescence being also lateral as well as terminal.

***Trichosporum rubrum* Merrill sp. nov.**

A scandent epiphyte reaching a length of from 4 to 6 m., rather strongly hirsute pilose with pale often appressed hairs, the leaves lanceolate to oblanceolate, the flowers red. Branches gray, the older ones glabrous, the younger branchlets densely appressed hirsute-pilose. Leaves subcoriaceous, 4 to 8 cm. long, 1.5 to 2 cm. wide, pale beneath, the upper surface rather densely appressed hirsute-pilose, the lower surface densely so on the midrib and nerves, gradually narrowed below to the slender acute base, more abruptly narrowed above to the acute apex, the margins entire, hirsute; nerves about 4 on each side of the midrib, ascending; petioles 1 to 4 cm. long, densely appressed hirsute. Flowers fascicled in the upper axils, the pedicels hirsute, 2 cm. long or less. Calyx hirsute, deeply 5-cleft nearly to the base, the lobes linear, about 6 mm. long, 1.5 mm. wide, blunt. Corolla nearly 3 cm. long, bright red, tubular, slightly curved, densely uniformly hirsute pilose with pale 2 mm. long hairs, the lobes elliptical-ovate, rounded, 4 to 5 mm. long. Filaments glabrous; anthers broad, 2 mm. long. Disk truncate or obscurely toothed, glabrous, cup-shaped, 2 mm. long. Ovary glabrous. Old capsules pale, glabrous, linear, 8 cm. long, the seeds not seen.

LUZON, District of Lepanto, Mount Data (4581 Merrill) November 4, 1905. On mossy tree trunks in ravines at about 2,200 m.

HYDROPHYLLACEÆ.

ELLISIOPHYLLUM Maxim.

Ellisiophyllum reptans Maxim. Bull. Acad. Pétersb. 16 (1871) 223.

LUZON, Province of Benguet, Pauai (4738 *Merrill*) November 8, 1905. In the mossy forest at about 2,200 m. Japan.

This monotypic genus has previously been known only from Japan, and the discovery of the species in the Philippines is of special interest, especially in connection with the now known, strong, northern floristic element in the highlands of Northern Luzon. The identification has been made from the generic descriptions in Bentham and Hooker, *Genera Plantarum*, and in Engler und Prantl, *Natürlichen Pflanzenfamilien*, as the original description of the genus and species is not available in Manila.

BORRAGINACEÆ.

BOTHRIOSPERMUM Bunge.

Bothriospermum tenellum (Hornem.) Fisch. & Mey. Ind. Sem. (1835) 24; Clarke in Hook. f. Fl. Brit. Ind. 4 (1883) 167. *Anchusia tenella* Hornem. Hort. Hafn. 1 (1813-1815) 176.

LUZON, Province of Benguet, Baguio (5774 *Elmer*) March, 1904. In waste places about old rice lands. An interesting addition to our knowledge of the northern element in the Philippine flora, Northern India to Manchuria, China, Formosa, and Japan.

TRIGONOTIS Stev.

Trigonotis philippinensis Merrill sp. nov.

An erect or somewhat spreading few branched herb 25 cm. high or less, with oblong-elliptical short acuminate or apiculate leaves, white flowers in terminal ebracteolate racemes, and glabrous tetrahedral shining nutlets. Branches more or less appressed hispid pubescent. Leaves coriaceous, 1 to 1.8 cm. long, 8 mm. wide or less, appressed hispid pubescent on both surfaces with scattered white hairs, the petioles 1 cm. long or less, the nerves obsolete. Racemes terminal, solitary, about 10 cm. long, appressed hispid pubescent, ebracteolate, the pedicels short, elongated to 5 or 6 mm. in fruit. Calyx nearly 3 mm. long, 5-cleft, the lobes narrowly ovate, acute, hispid, nearly 2 mm. long. Corolla white, 4 mm. long, the tube nearly 2 mm. long, the 5 lobes spreading, broadly obovate, rounded, the throat with 5 rather broad scales. Stamens 5, included, the filaments very short, the anthers oblong, about 0.8 mm. long. Ovary glabrous; style simple, slender, about 1 mm. long. Carpels 4, with 4 acute edges, black, glabrous, shining, about 1 mm. long, the scar small, basal.

LUZON, Province of Benguet, Pauai to Baguio (4700 *Merrill*) November 9, 1905. Growing on damp mossy cliffs just below the limits of the mossy forest at an altitude of about 1,900 m., rare.

An interesting addition to our knowledge of the northern element in the Philippine flora, no species of the genus having previously been reported from the Philippines, all which had been known being confined to the Asiatic continent, Japan, and the Luchu Archipelago.

VERBENACEÆ.

PREMNA Linn.

In F.-Villar's *Novissima Appendix* to the third edition of Blanco's *Flora de Filipinas*, 11 species of *Premna* are enumerated. Of these eleven species, but two are here enumerated under the same names as those used by F.-Villar, *Premna adenosticta* Schauer and *P. cumingiana* Schauer. From synonymy and other sources I have been able satisfactorily to reduce five species, *P. foetida* F.-Vill., non Reinw.; *P. pubescens* F.-Vill., non Blume; *P. vestita* Schauer; *P. tomentosa* F.-Vill., non Willd., and *P. mucronata* F.-Vill., non Roxb., while judging from the native names cited the species enumerated as *Premna viburnoides* Wall., is *P. nauseosa* Blanco. *Premna philippinensis* Turcz., is a species of *Vitex*, *V. turczaninowii* Merr.²⁴ *Premna gaudichaudii* Schauer is enumerated by F.-Villar, but is not credited to the Philippines, this with *P. marianarum*, the remaining species of Villar's list, should be excluded from the Philippine flora, unless at some future time material is collected that agrees with the descriptions of these species.

1. Calyx equally or subequally 4-toothed.
 2. A tree; leaves long acuminate, pale; corymbs densely stellate pubescent (1) *P. adenosticta*
 2. Scandent shrubs; leaves acute or short acuminate, dark when dry; corymbs glabrous or pubescent, never stellate pubescent.
 3. Leaves broadly elliptical-ovate, 10 to 20 cm. long; inflorescence 12 to 14 cm. in diameter, crisped pubescent (2) *P. membranacea*
 3. Leaves oblong, 5 to 9 cm. long; inflorescence 4 to 6 cm. in diameter, ferruginous pubescent, the pubescence not stellate or crisped (3) *P. oblongifolia*
1. Calyx subequally 5-toothed, or bilabiate, one lip entire and the other 2-toothed, or one lip 2-toothed and the other 3-toothed.
 2. Leaves ample, rufous or ferruginous stellate pubescent..... (4) *P. cumingiana*
 2. Leaves glabrous or pubescent, never stellate pubescent.
 3. Scandent; leaves pubescent beneath..... (5) *P. subscandens*
 3. Erect trees or shrubs.
 4. Leaves uniformly and usually densely pubescent beneath.
 5. Leaves 6 cm. long or less; petioles 5 mm. long or less..... (6) *P. depauperata*
 5. Leaves 10 to 20 cm. long; petioles 2 to 6 cm. long (7) *P. odorata*
 4. Leaves glabrous, or if pubescent only so on the nerves and midrib.
 5. Leaves 6 to 9 cm. long.
 6. Leaves coriaceous; inflorescence dense (8) *P. congesta*
 6. Leaves membranous; inflorescence rather lax (9) *P. nauseosa*
 5. Leaves 9 to 18 cm. long; inflorescence more or less lax.
 6. Leaves usually oblong or oblong-ovate, acute or obtuse; nerves 4 to 5, glabrous, or at least pubescent only in the axils beneath..... (10) *P. integrifolia*

²⁴ *Govt. Lab. Publ.* (1906), 35, 77.

6. Leaves ovate, acuminate; nerves 5 to 6, pubescent on both surfaces; corolla 3 mm. long.....(11) *P. nitida*
 6. Leaves usually broadly ovate, acuminate; nerves 6 to 7, glabrous, or pubescent on the upper surface or on both; corolla 5.5 to 6 mm. long..(12) *P. subglabra*

- (1) ***Premna adenosticta*** Schauer in DC. Prodr. 11 (1847) 630; Miq. Fl. Ind. Bat. 2 (1856) 892; F.-Vill. Nov. App. (1883) 159; Vid. Phan. Cuming. Philip. (1885) 134; Rev. Pl. Vasc. Filip. (1886) 209; Ceron Cat. Pl. Herb. (1892) 131.

PHILIPPINES (1230 *Cuming*) 1836-1840, cotype. LUZON, Province of Rizal, Bosoboso (2863 *Ahern's collector*) March, 1905; San Mateo (1122 *Ahern's collector*) May, 1904; Antipolo (435 *Ahern's collector*) February, 1904; Province of Camarines, Pasacao (103 *Ahern*) March, 1902. Endemic.

- (2) ***Premna membranacea*** Merr. Govt. Lab. Publ. 35 (1906) 65.

LUZON, Province of Rizal, Bosoboso (1165, 3102 *Ahern's collector*) June, 1904, June, 1905. T., *Alamag*. Endemic.

- (3) ***Premna oblongifolia*** Merr. l. c. 29 (1905) 48.

LUZON, Province of Benguet, Baguio (5990 *Elmer*) March, 1904; Province of Tayabas (Infanta) (816 *Whitford*) September, 1904. Endemic.

- (4) ***Premna cumingiana*** Schauer in DC. Prodr. 11 (1847) 634; Vidal, Cat. Pl. Prov. Manila (1880) 39; Rev. Pl. Vasc. Filip. (1886) 209; Phan. Cuming. Philip. (1885) 134; F.-Vill. Nov. App. (1883) 159; Miq. Fl. Ind. Bat. 2 (1856) 778; Koorders Meded. 's Lands Plantent. 19 (1898) 559. *Premna cordata* Blanco, Fl. Filip. ed. 1 (1837) 489, non R. Br. *Premna tomentosa* Blanco, l. c., ed. 2 (1845) 342; ed. 3, 2 (1878) 269; F.-Vill. Nov. App. (1883) 159, non Willd. *Premna cardiophylla* Schauer, l. c. 638; Miq. Fl. Ind. Bat. 2 (1856) 900.

PHILIPPINES (778, 1280 *Cuming*) 1836-1840, cotypes. LUZON, Province of Rizal, San Mateo (1850 *Ahern's collector*) September, 1904; (112 *Merrill*) Decades Philip. Forest. Fl., coll. *Ahern's collector*, May, 1904, distributed as *Geunsia cumingiana*; Bosoboso (2676 *Merrill*) June, 1903; (3133 *Ahern's collector*) June, 1905; Province of Camarines, Pasacao (803 *Ahern*) 1902. MIN-DANAO, District of Davao (689 *Ahern*) June, 1901; (109 *DeVore & Hoover*) April, 1903.

A species known only from the Philippines and Celebes. *Premna cordata* Blanco, non R. Br. = *Premna tomentosa* Blanco, non Willd., although very imperfectly described by Blanco, is certainly referable to Schauer's species. Blanco's short description applies well to the specimens above cited, especially his expression "El involuero universal de la umbela, el de la parcial y el de la florecita, dos hojuelas alesnadas," by "involucro" Blanco meaning the bracts and bracteoles. *Premna cardiophylla* Schauer, is only a new name for Blanco's *Premna cordata*, and is included by the former in his monograph under doubtful or not sufficiently known species. T., *Maguilac*; according to Blanco, *Malaapi*.

- (5) ***Premna subscandens*** Merrill sp. nov.

A scandent shrub, the leaves, branchlets, and inflorescence more or less pubescent, with subequally 5-toothed or obscurely 2-lipped calyces, the corollas 4-lobed. Branches light gray or brown, glabrous, obscurely angled, the lenticels few, the younger branchlets pubescent, sometimes densely so. Leaves ovate, membranous, 6 to 10 cm. long, 3 to 7 cm.

wide, entire or distantly obscurely toothed above, acuminate, the base broad, rounded or cordate, sometimes acute, thinly pubescent on both surfaces, more densely so beneath, often densely pubescent on the nerves and midrib, except the latter sometimes becoming glabrous or nearly so, shining, usually dark colored when dry; nerves 5 on each side of the midrib, somewhat prominent, the reticulations somewhat lax; petioles 1 to 4 cm. long, pubescent. Cymes terminating the branches and short lateral branchlets, many flowered, somewhat dense, 5 to 14 cm. across, all parts except the corollas uniformly densely softly grayish brown pubescent, the linear bracts 5 to 7 mm. long, densely pubescent, the bracteoles similar but much smaller. Flowers white or greenish, fragrant. Calyx densely softly pubescent, cup-shaped, 3 mm. long, 5-toothed, the teeth subequal, rounded or acute, 1 mm. long or less, or sometimes obscurely 2-lipped, one lip 2-toothed, the other 3-toothed. Corolla 5 mm. long, glabrous outside, villous within, 2 lipped, one lip ovate, entire, nearly 2 mm. long, the other coarsely 3-lobed, the lobes nearly equaling the entire lip. Stamens 4, didynamous; filaments 4 to 5 mm. long, villous below; anthers about 0.4 mm. long. Ovary glabrous; style 5.5 mm. long.

LUZON, Province of Rizal, Antipolo (449, 443 *Ahern's collector*) April, 1904; Bosoboso (1874 *Merrill*) April, 1903. Ticao (1095 *Clark*) May, 1904. T., *Alagabaguin*, *Alagao-baguin*. V., *Uradgao*.

(6) ***Premna depauperata*** Merrill sp. nov.

An undershrub, 1 m. high or less, with short petioled, coriaceous oblong-ovate to elliptical-ovate, small leaves, densely ferruginous pubescent inflorescence and 5-toothed calyx. Branches terete, light brown, mostly densely ferruginous pubescent, lenticellate. Leaves 3 to 6 cm. long, 2 to 3.5 cm. wide, shining above, entire, the margins recurved, acute, the base broad, rounded-cordate, the upper surface sparingly strigose pubescent, the lower surface somewhat densely pubescent, glandular; nerves 4 to 5 on each side of the midrib, distinct beneath, anastomosing; petioles densely pubescent, 5 mm. long or less. Corymbs terminal, 4 to 5 cm. long, nearly as wide, densely ferruginous pubescent throughout, densely flowered, the lower bracts small, foliaceous, the upper and bracteoles linear. Calyx cup-shaped, nearly 3 mm. long, sparingly strigose pubescent, subequally 5-toothed, or obscurely 2-lipped with one 2-toothed and one 3-toothed lip. Corolla 4 mm. long, pubescent outside, villous on the throat within, 4-lobed, one lobe lip-like, exceeding the others. Stamens not exceeding the corolla lobes; anthers 0.5 mm. long; filaments glabrous. Ovary glabrous, ovoid or globose; style 3.5 mm. long. Fruit glabrous, ovoid, about 4 mm. long.

CULION (603 *Merrill*) December, 1902. On dry open grassy hillsides 30 to 40 m. above the sea. A species well characterized by its small size, small leaves, which are cordate at the base, and short petioles.

- (7) ***Premna odorata*** Blanco Fl. Filip. ed. 1 (1837) 489; ed. 2 (1845) 341; ed. 3, 2 (1878) 268; Schauer in DC. Prodr. 11 (1847) 638; Miq. Fl. Ind. Bat. 2 (1856) 900; Merr. Govt. Lab. Publ. 27 (1905) 68; l. c. 35 (1906) 76. *Premna vestita* Schauer, l. c. 631; Miq. l. c. 892; F.-Vill. Nov. App. (1883) 159; Vidal, Phan. Cuming. Philip. (1885) 134; Rev. Pl. Vase. Filip. (1886) 209; Sinopsis, Atlas (1883) t. 74. f. E.; Merr. Forest. Bur. Bull. 1 (1903) 51. *Premna serratifolia* Blanco l. c. ed. 2 (1845) 269; ed. 3, l. c. *Premna tomentosa* F.-Vill. l. c. ex syn. Blanco, non Blume. *Premna foetida* F.-Vill., l. c. non Reinw., ex syn. Blanco.

PHILIPPINES (599 *Cuming*) 1836-1840, cotype of *Premna vestita* Schauer. LUZON, Manila (22, 3421 *Merrill*) April, 1902; November, 1903; (718 *Ahern*) April, 1901; Province of Bataan, Dinalupihan (1514 *Merrill*) January, 1903; Lamao River (2590 *Meyer*) February, 1905; Mariveles (748, 780 *Ahern*) January, 1902; Province of Pampanga (37 *Parker*) May, 1904; Province of Rizal, Antipolo (24 *Merrill*) Decades Philip. Forest Fl., coll. *Ahern's collector*, February, 1904; Province of Tayabas, Lucena (2892 *Merrill*) June, 1903; Province of Union, Bauang (5561 *Elmer*) February, 1904; Province of Benguet, Sablan (6154 *Elmer*) April, 1904. MINDORO, Baco (1218 *Merrill*) January, 1903. GUIMARAS (235 *Gammill*) January, 1904.

Premna vestita is placed by Schauer in the section with 4-toothed calyces, but in two specimens of *Cuming's* No. 599 in our herbarium, on which number the species was based, the calyces are distinctly 5-toothed. This is certainly the most abundant and widely distributed species of the genus in the Philippines, and is the one utilized by the natives as noted by Blanco. Blanco's description applies very closely, and I am of the opinion that there can be no doubt as to the correctness of the identification. *Premna serratifolia* Blanco is reduced to *P. odorata*, as Blanco states that the species can be distinguished from the latter only by the serrate leaves. Nos. 1218 and 3421 *Merrill* and No. 37 *Parker* show this character, but no other characters on which I am able to separate this form as a distinct species. As a result of the reduction of *Premna serratifolia* to *P. odorata*, I have also so reduced *P. foetida* F.-Vill., to which F.-Villar referred *P. serratifolia* Blanco. For the same reason F.-Villar's *Premna pubescens* is reduced, he having referred *Premna odorata* Blanco to Blume's species. From F.-Villar's remark, however, it is possible that he referred specimens of *Premna cumingiana* to *Premna pubescens*. Abundant and widely distributed in the Philippines. T., Alagao. V., Adgao.

- (8) ***Premna congesta*** Merrill sp. nov.

A shrub or small tree with small ovate to elliptical-ovate nearly glabrous leaves 2.5 to 7 cm. long, and densely flowered terminal cymes 3 to 5 cm. in diameter, the calyx 2-lipped, the corolla 4-lobed. Branches terete lenticellate, light gray or brownish, becoming quite glabrous, the younger parts with few scattered, weak hairs. Leaves subcoriaceous, 1.5 to 4.5 cm. wide, shining and glabrous above, or the nerves somewhat pubescent, paler beneath and minutely punctulate, glabrous, or the axils of the nerves barbellate, and sometimes the midrib somewhat pubescent, entire or somewhat crenate above, acute or obtuse, rarely very short acuminate, the base rounded; nerves about 4 on each side of the midrib, somewhat prominent; petioles slender, 1 cm. long or less, somewhat pubescent. Cymes pubescent with few weak, scattered hairs, the branches spreading or ascending, the bracts and bracteoles linear to lanceolate, 1.5 to 3 mm.

long, somewhat pubescent, the short pediceled flowers subtended by about 3 linear bracteoles. Calyx glabrous, cup-shaped, 2 mm. long, 2-lipped, one lip coarsely 2-toothed, the other truncate, subentire or minutely 2 to 3 toothed. Corolla 4 to 4.5 mm. long, tubular, 4-lobed, three lobes equal, ovate, about 1.5 mm. long, obtuse, the fourth somewhat larger, glabrous outside, villous within. Stamens 4, didynamous; anthers about 0.5 mm. long. Ovary glabrous; style slender, nearly 4 mm. long.

LUZON, Province of Rizal, Bosoboso (3281 *Ahern's collector*) August 6, 1905. T., *Alacaas*. According to the native collector, the flowers are reddish in color.

- (9) ***Premna nauseosa*** Blanco Fl. Filip. ed. 1 (1837) 489; Schauer in DC. Prodr. 11 (1847) 638; Miq. Fl. Ind. Bat. 2 (1856) 900; Vidal, Phan. Cuming. Philip. (1885) 134; Rev. Pl. Vasc. Filip. (1886) 209; Merrill, Govt. Lab. Publ. 27 (1905) 68. *Premna mucronata* F. Vill. Nov. App. (1883) 159; Schauer, l. c. 635, in part; Miq. Fl. Ind. Bat. 2 (1856) 897, in part, with reference to No. 1367 Cuming. *Premna leucostoma* Naves, Fl. Filip. ed. 3, pl. 346, non Miq.

PHILIPPINES (1367 Cuming) 1836-1840, in Herb. Bureau of Science. LUZON, Province of Zambales, Subic (2191, 2915 Merrill) May, 1903; Province of Bataan, Mount Mariveles (387 Whitford) June; (6841 Elmer) November; (769, 1271, 1275, 1613 Borden) May to August, 1904; Province of Tarlac (705 Ahern) May, 1901; Province of Rizal, Antipolo (24 Guerrero) June, 1903; (1682 Merrill) March, 1903.

A species widely distributed in Luzon, usually somewhat pubescent, in which character Blanco's short and imperfect description does not apply. It is, however, the only species at present known to me that has a somewhat disagreeable odor, the character on which Blanco's specific name was based. This species is enumerated by Schauer as doubtful, or not sufficiently known. According to Vidal, Nos. 693 and 1353 Cuming also represent it, and it is possible that No. 1451 Cuming is also the same, a fragment of the latter number existing in our herbarium. From the native names cited, *Premna viburnoides* Vidal, Cat. Pl. Prov. Manila (1880) 134; F. Vill. Nov. App. (1883) 159, non Wall., should be referred to this species, *Premna nauseosa* being quite universally known to the Tagalogs as *Molauain aso*, literally "dog molave," *Molauain* or *Molave* being the Tagalog name for the valuable timber trees of the genus *Vitex*, the timber of *Premna nauseosa* being considerably utilized for certain constructions, and somewhat resembling *Molave*.

- (10) ***Premna integrifolia*** Linn. Mant. (1767) 252; Clarke in Hook. f. Fl. Brit. Ind. 4 (1885) 574; Forbes & Hemsl. Journ. Linn. Soc. Bot. 26 (1890) 255; Schum. und Lauterb. Fl. Deutsch. Schutz. Südsee (1901) 523.

LUZON, Province of Camarines, Pasacao (141, 138, 801 Ahern) 1902; Province of Tayabas (Infanta) (760 Whitford) September, 1904; Province of Zambales, Subic (2199 Merrill) May, 1903; Province of Principe, Baler (1083 Merrill) October, 1902; Province of Bataan, Lamao River (2043 Borden) October, 1904. MINDORO, Calapan (899 Merrill) April, 1903; Baco (1173 Merrill) January. Apo Island, Mindoro Strait (427 Merrill) December, 1902. MINDANAO, District of Davao (350 Copeland) March, 1904; (138, 226 DeVore & Hoover) April, 1903.

A species apparently confined to the seashore or near it, widely distributed in the Philippines. Tropical Asia to Malaya, New Guinea and Polynesia. T., *Alagao*, *Alagao dagat*. (*Dagat* in Tagalog=ocean).

- (11) **Premna nitida** K. Sch. Fl. Kaiser Wilhelms Land (1889) 120; Sch. und Lauterb. Fl. Deutsch Schutz. Südsee (1901) 523; Usteri, Beitr. Kennt. Philip. Veg. (1905) 123.

This species is reported from Negros and Panay by Usteri, but I have seen no Philippine specimens to which Schumann's description applies. The species is known from New Guinea and doubtfully from Celebes.

- (12) **Premna subglabra** Merrill sp. nov.

A tree 7 to 12 m. high, becoming nearly glabrous, the slightly pubescent calyces obscurely 2-lipped, one lip entire or very obscurely 2 to 3 toothed, the other 2-toothed. Branches light gray or brown, glabrous, terete, the branchlets reddish brown, obscurely angled, deciduously short-pubescent, becoming glabrous or nearly so. Leaves ovate to oblong-ovate, chartaceous, entire, short acuminate, the base broad, rounded, subtruncate to somewhat cordate, or sometimes acute, shining, glabrous above except the somewhat pubescent midrib and nerves, paler beneath, obscurely minutely glandular punctate, glabrous, or the nerves and midrib very slightly pubescent, the axils sometimes barbellate; nerves prominent beneath, ascending, 6 to 7 on each side of the midrib, the reticulations distinct; petioles 2 to 7 cm. long, usually pubescent on the upper surface, otherwise glabrous. Corymbs terminal, spreading, many flowered, 9 to 14 cm. long, 10 to 20 cm. wide, more or less ferruginous pubescent throughout, the ultimate branchlets rather densely so, the bracts linear, 5 to 8 mm. long, the bracteoles similar but much smaller. Flowers greenish. Calyx slightly pubescent, becoming glabrous, cup-shaped, 2 mm. long. Corolla 5.5 to 6 mm. long, glabrous outside, villous within, 2-lipped, one lip short, entire or retuse, the other 3-lobed, the middle lobe much exceeding the lateral ones. Stamens slightly exceeding the corolla lobes; filaments villous below; anthers about 0.6 mm. long. Ovary glabrous; style 4 to 5 mm. long. Fruit globose, dark purple when mature, glabrous, about 3 mm. in diameter.

LUZON, Province of Tayabas, Atimonan (670, 671 *Whitford*) August 19, 1904. MINDORO, Pinamalayan (2165 *Merrill*) May, 1903; Pola (2243 *Merrill*) May, 1903. In forests along streams below 100 m. T., *Alagao*.

LABIATÆ.

COLEUS Lour.

Coleus macranthus Merrill sp. nov. § *Solenostemonoides*.

An erect branched herb 1 to 2 m. high, more or less glandular ferruginous puberulent, with long petioled, ovate to oblong-ovate, rather strongly dentate leaves, narrow many flowered panicles, the flowers pure white to purple, often 2 cm. long. Branches brown when dry, densely glandular puberulent to nearly glabrous. Leaves membranous, 4 to 15 cm. long, 3 to 7 cm. wide, the base often broad and subtruncate, sometimes acute, decurrent, the apex short acuminate, the margins entire

near the base, above prominently and regularly dentate, dull, the nerves and midrib on both surfaces usually puberulent, paler beneath and with numerous small punctate glands; nerves about 10 on each side of the midrib, prominent; petioles 2 to 7 cm. long. Panicles narrow, 15 to 25 cm. long, the branches verticillate, spreading, branched, glandular puberulent, 2 cm. long or less; bracts deciduous, ovate, acuminate, 7 to 8 mm. long. Calyx glabrous within, glandular puberulent outside, in fruit about 10 mm. long, the upper lip broadly ovate, acute or slightly acuminate, flat, about 4 mm. long, the lateral teeth ovate to elliptical, rounded, about 2.5 mm. long, the lower lobe oblong, 7 mm. long, 2 toothed, the teeth lanceolate or linear lanceolate, acuminate, about 1.5 mm. long. Corolla 1.5 to 2 cm. long, slightly puberulent, the lower lip nearly 1 cm. long, the upper short, 3-lobed. Nutlets ovoid, 1.7 mm. long, smooth, glabrous, shining.

LUZON, District of Lepanto, Mount Data (4502, 4483, 4505 *Merrill*) November, 1905. In the mossy forest at about 2,200 m., abundant.

Var. *crispipila*, n. var.

Similar to the species, flowers white, the inflorescence puberulent and with many crisped ferruginous hairs, the leaves also with few or many crisped hairs on both surfaces and margins.

LUZON, Province of Benguet, Suyoc to Pauai (4780 *Merrill*) November, 1905. On high ridges in the mossy forest at about 2,200 m.

PLECTRANTHUS L'Her.

Plectranthus diffusus Merrill sp. nov.

A much branched, diffuse, lax herb 1.5 to 2.5 m. high with many flowered narrow lateral panicles forming large compound terminal leafy panicles, more or less pubescent throughout with pale or ferruginous hairs. Branches angled, gray or brownish, pubescent. Leaves ovate to oblong-ovate, 2 to 6 cm. long, 1 to 3 cm. wide, membranous, acuminate, the base acute, entire below, above rather prominently serrate-dentate, with scattered crisped hairs on both surfaces; nerves, 5 to 6 on each side of the midrib; petioles 1 cm. long or less. Branchlets of the inflorescence opposite, several flowered, 1.5 cm. long or less, the bracts foliaceous, gradually reduced upwards. Calyx somewhat hirsute, about 2 mm. long, subequally 5-toothed, the teeth acute, less than 0.5 mm. long. Corolla deep purplish blue, 5 to 6 mm. long, straight, somewhat pubescent outside, the limb gibbous, 2-lipped, the upper lip short, 3-lobed, the lower one entire about 3 mm. long. Stamens free, filaments very slightly pubescent below. Calyx in fruit scarcely accrescent, reflexed. Nutlets ovoid or elliptical, glabrous, smooth, about 1 mm. long.

LUZON, District of Lepanto, Mount Data (4554 *Merrill*) November 4, 1905. In damp shaded ravines along streams at about 2,000 m.

SOLANACEÆ.

SOLANUM Linn.

Solanum inaequilaterale Merrill sp. nov.

An unarmed, more or less stellate pubescent shrub 2 to 3 m. high, with alternate subentire or undulate leaves and extra-axillary cymes. Branches light gray, glabrous, the younger ones black when dry, more or less densely stellate pubescent. Leaves membranous or submembranous, oblong-ovate, acute or acuminate, the base acute or obtuse, inequilateral, the lamina on one side of the midrib extending somewhat down the petiole, the margins entire or somewhat undulate, glabrous above, more or less densely stellate pubescent beneath, the young leaves very densely so, the older ones subglabrous; nerves 5 to 6 on each side of the midrib; petioles 2 to 3 cm. long. Cymes peduncled, stellate pubescent, densely or laxly flowered, about 5 cm. long. Calyx densely stellate pubescent, about 4 mm. long, subtruncate or obscurely 5-toothed. Corolla pale purple, 11 mm. long, stellate pubescent outside, the tube 2 mm. long, the 5 lobes oblong to oblong-lanceolate, acute, about 3 mm. wide. Stamens 5, oblong, about 5 mm. long. Ovary 2-celled, glabrous or slightly pubescent at the apex, the style glabrous, about 6 mm. long. Fruit globose, glabrous, shining, bright red when mature, about 7 mm. in diameter, the calyx not enlarged. Seed 2 to 2.5 mm. in diameter. Inflorescence becoming nearly or quite glabrous in fruit.

LUZON, Province of Benguet, Suyoc to Pauai (4807 *Merrill*) November 7, 1905. Border of the mossy forest on high ridges at about 2,000 m. No. 6204 *Elmer*, from Sablan, the same province, appears to be a form of this species with thin, less pubescent leaves and longer, lax cymes.

SCROPHULARIACEÆ.

ALECTRA Thunb.

Alectra dentata (Benth.) O. Kuntze Rev. Gen. Pl. (1891) 458. *Hymenospermum dentatum* Benth. in Wall. Cat. 3963. *Alectra indica* Benth. in DC. Prodr. 10 (1846) 339; Hook. f. Fl. Brit. Ind. 4 (1884) 297; Forbes & Hemsl. Journ. Linn. Soc. Bot. 26 (1890) 201. *Melasma indica* Wettst. in Engl. und Prantl. Nat. Pflanzenfam. 4 (1891) 3B: 91.

LUZON, Province of Benguet, Baguio to Ambuklao (4350 *Merrill*) October 24, 1905. Dry open grass lands in thin pine forests at about 1,500 m. Not previously reported from the Philippines.

Southern China to the mountains of Burma, India, and Mauritius.

EUPHRASIA Linn.

Euphrasia borneensis Stapf, Trans. Linn. Soc. Bot. II. 4 (1894) 210. *pl.* 16. *f.* 1-16.

LUZON, Province of Benguet, Suyoc to Pauai (4720, 4722 *Merrill*) November 7, 1905. On dry open grassy ridges at about 2,200 m.

No species of the genus has been previously reported from the Philippines, *Euphrasia borneensis* having previously been known only from the type locality, Mount Kanabalu, British North Borneo. The specimens cited above differ from *Euphrasia borneensis* as described by Stapf in some slight minor characters, but

these I believe are scarcely sufficient to warrant the distinguishing of the Philippine plant as a distinct species. *Gaultheria borneensis* Stapf, also originally described from Mount Kinabalu specimens, and later reported from the Philippines by Rendle,²⁵ was also found near Pauai (4796 Merrill).

SOPUBIA Hamilt.

Sopubia trifida Hamilt. in D. Don Prodr. Fl. Nepaul. (1802) 88; Hook. f. Fl. Brit. Ind. 4 (1884) 302; Benth. in DC. Prodr. 10 (1846) 522; Forbes & Hemsl. Journ. Linn. Soc. Bot. 26 (1890) 202.

LUZON, Province of Benguet, Baguio (6518 Elmer) June, 1904. On grassy hillsides in thin pine forests at an altitude of about 1,500 m. Flowers yellowish, the throat pink or purplish.

No representative of the genus has previously been reported from the Philippines, the above species extending from southern China to British India and Ceylon.

VANDELLIA Linn.

Vandellia grandiflora Merrill sp. nov.

An erect or spreading, simple or slightly branched, more or less hirsute herb 10 cm. high or less, the calyx teeth 5, equal, less than half as long as the calyx tube, the corolla about 12 mm. long. Branches, leaves, petioles, pedicels, and calyces sparingly hirsute with scattered white hairs. Leaves opposite, ovate to oblong-ovate, 0.5 to 1.5 cm. long, short petioled, acute, the base obtuse, the margins usually coarsely serrate. Flowers solitary, pediceled, axillary, the pedicels 1.5 to 2 cm. long. Calyx in anthesis oblong, 6 mm. long, not keeled or winged, reticulate, equally 5-toothed, the teeth lanceolate, acuminate, about 2.5 mm. long. Corolla pale blue or purplish, the tube cylindrical, enlarged above, upper lip broad, about 4 mm. long, cleft at the apex, the lower lip 6 to 7 mm. long, 3-lobed, the middle lobe the largest. Stamens 4, the two posterior included, the two anterior longer and prominently appendaged near the base of the filaments. Ovary and style glabrous. Fruiting calyx about 8 mm. long, oblong, the teeth scarcely longer than in anthesis. Capsule oblong, glabrous, tipped by the style, equaling or slightly shorter than the calyx. Seeds many, flattened, ovate, about 0.5 mm. in diameter.

LUZON, District of Lepanto, Mount Data (4572 Merrill) November 4, 1905; Province of Benguet, Baguio to Ambuklao (4359 Merrill) October 24, 1905; Suyoc to Pauai (4735 Merrill) November 7, 1905. On dry open grassy slopes in thin pine forests 1,600 to 2,000 m.

BIGNONIACEÆ.

NYCTICALOS Teysm. et Binn.

Nycticalos cuspidatum (Blume) Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 249, t. 8. f. B. *Tecoma cuspidata* Blume, Rumphia 4 (1848) 35.

PALAWAN, Puerto Princesa (254 Bermejós) December, 1905. In forests; flowers yellow. Celebes and the Moluccas.

An undetermined species of this genus has previously been reported from Luzon

²⁵ Journ. Bot. (1896) 34, 355.

by Ceron,²⁶ No. 3395 *Vidal*, but our specimen cited does not appear to be sufficiently distinct from Miquel's species. The Palawan specimens differ from *Nycticalos cuspidatum* as described by Miquel in having shorter petioles, and slightly larger calyces, while the leaves are acute, scarcely cuspidate.

RADERMACHERA Hassk.

Radermachera biternata Merrill sp. nov.

A small tree about 8 m. high, quite glabrous throughout, with bipinnate leaves, elliptical-ovate, usually obtuse leaflets and few flowered panicles much shorter than the leaves, the flowers about 5.5 cm. long. Branches gray or brownish, the younger parts black when dry. Leaves 20 cm. long or less, opposite, biternate; leaflets 5 to 9 cm. long, 2.5 to 5 cm. wide, subcoriaceous, shining, the apex rounded obtuse or broadly acute, the base acute, the margins revolute; primary nerves about 10 on each side of the midrib, rather distinct beneath, the reticulations netted, rather close; petiolules of the lateral leaflets 1.5 cm. long or less, of the terminal ones about 3 cm. long. Inflorescence much reduced, the rhachis 3 cm. long or less, the branches very short or none. Flowers few. Calyx about 1 cm. long, closed in bud, in anthesis unequally 3-lobed, the lobes short, acute. Corolla 5 to 5.5 cm. long, the tubular portion less than 1 cm. long, about 3.5 mm. in diameter, enlarged-ventricose above, the lobes about 1.5 cm. long, rounded, entire, glabrous pink or pale purple. Stamens about 2 cm. long. Style 2.5 cm. long. Fruit unknown.

CULION (568 *Merrill*) December 24, 1902. BUSUANGA (3491 *Curran*) December 31, 1905, both of these islands belonging to the Calamianes Group, between Mindoro and Palawan.

A species growing in open grassy valleys slightly above the sea level well characterized by its much reduced inflorescence and large flowers.

RUBIACEÆ.

GALIUM Linn.

Galium philippinense Merrill sp. nov. *G. ciliare* Elm. Leaf. Philip. Bot. (1906) 4, non Hook.

A tufted erect or diffuse, much branched perennial, more or less ciliate-pilose herb 10 to 30 cm. high, the leaves in whorls of fours, 3-nerved from the base, the cymes short, lateral, few flowered. Branches 4-angled, more or less pilose when young, but not hispid, becoming nearly glabrous. Leaves elliptical-ovate, sessile or nearly so, 5 to 8 mm. long, 2 to 4 mm. wide, acute at both ends, more or less ciliate-pilose with long scattered white hairs, 3-nerved. Cymes about 1 cm. long, mostly 5-flowered, the peduncles 1 cm. long or less, glabrous or nearly so, the bracts foliaceous, oblong-lanceolate, about 2 cm. long. Flowers white, corolla rotate, 0.8 mm. long, 4-lobed, the lobes ovate, obtuse. Calyx tube ovoid. Fruit about 1 mm. in diameter, glabrous or somewhat rugose when dry.

²⁶ *Cat. Pl. Herb.* (1892), 127.

LUZON, Province of Benguet, Mount Santo Tomas (6557 *Elmer*) June, 1904: District of Lepanto, Mount Data (4531 *Merrill*) November, 1905. On dry grassy slopes in thin pine forest above 2,000 m. A second Philippine species is represented by No. 6592 *Elmer* and No. 4414 *Merrill* from Benguet Province. From the descriptions available, and without access to authentic material, I am unable to separate these two numbers from the Australian *Galium gaudichaudii* DC., as determined by Mr. Elmer.

HEDYOTIS Linn.

Hedyotis microphylla Merrill sp. nov.

An erect glabrous shrub or undershrub 1 to 2 m. high, with small, obscurely nerved, usually ovate-lanceolate leaves 1 to 3 cm. long, and axillary and terminal peduncled, usually 3-flowered cymes, the capsules 2-celled, septicidal. Branches slender light gray, quadrangular. Leaves submembranous dull or slightly shining, somewhat paler beneath, 5 to 8 mm. wide, the base acute, the apex acute or slightly acuminate, often blunt; nerves very obscure, nearly obsolete, about 3 on each side of the midrib; stipules short, 3-partite, the lobes narrow. Cymes 1 to 2 cm. long, the bracts foliaceous often 3 mm. long, the pedicels about 5 mm. long. Flowers white. Calyx 3 mm. long, the tube ovoid 1.5 mm. long, the lobes 4, persistent, oblong ovate, obtuse, about 1.5 mm. long. Corolla 5 mm. long, glabrous outside, the throat and base of the lobes villous inside, the tube broad, the lobes recurved, oblong ovate or ovate, acute, about 2 mm. long. Filaments nearly 2 mm. long; anthers narrowly oblong, 1.5 mm. Ovary 2-celled, each few ovuled; style 2.5 mm. long; stigma 2-cleft. Capsule elliptical-ovoid about 4 mm. long crowned by the calyx lobes, 2-celled, each cell with 2 or 3 flattened elliptical seeds about 1.5 mm. long, at length septicidally dehiscent from the apex.

LUZON, Province of Benguet, Pauai to Baguio (4693 *Merrill*) November, 1905; Suyoc to Pauai (4736 *Merrill*) November, 1905. On high ridges in the mossy forest 2,000 to 2,300 m.

PAVETTA Linn.

Pavetta dolichostyla Merrill sp. nov.

A small shrub about 2 m. high with membranous slightly pubescent or nearly glabrous leaves and peduncled terminal cymes, the corolla tubes 3 cm. long, the exerted portion of the styles 4 to 4.5 cm. long. Branches greenish, glabrous, the stipules glabrous, narrowly ovate, 6 to 7 mm. long, acuminate, deciduous. Leaves 20 to 25 cm. long, 7 to 9 cm. wide, oblong oblanceolate to broadly oblong-lanceolate, gradually narrowed below to the acute or acuminate base, and above to the acuminate apex, shining above, beneath paler and puberulent on the midrib and lateral nerves; nerves 12 to 14 on each side of the midrib, curved, anastomosing, the reticulations lax; petioles 1 to 2.5 cm. long, pubescent. Cymes terminal, pubescent, about 3 from each branchlet, few flowered, the peduncles 1.5 cm. long, subtended by broad bracts, the upper bracts and bracteoles linear to linear-lanceolate. Pedicels pubescent, 3 to 4 mm. long. Calyx

cup-shaped, about 2.5 mm. long, pubescent with short spreading hairs, 4-toothed, the teeth acute, 0.5 mm. long. Corolla slender, glabrous, white, 3 cm. long, the lobes spreading, oblong-lanceolate to oblong-ob lanceolate, obtuse, 10 mm. long, 3 to 3.5 mm. wide. Anthers linear, 5 to 6 mm. long, spirally twisted when dry. Exserted portion of the style slender, glabrous 4 to 4.5 cm. long.

MINDORO, Bongabong River (3714 *Merritt*) March 21, 1906. In forests, river valley near sea level. A species well characterized by its long corolla tubes and very long exserted styles.

PSYCHOTRIA Linn.

Psychotria crispipila Merrill sp. nov.

A shrub 3 to 4 m. high with elliptical-ovate leaves which are prominently nerved and rather densely fulvous pubescent beneath with crisped hairs, the flowers crowded in dense subcapitate cymes on 2.5 to 4 cm. long terminal peduncles. Branches, petioles, and inflorescence also rather densely fulvous pubescent with crisped hairs. Leaves 7 to 10 cm. long, 3 to 5 cm. wide about equally narrowed to both the acute apex and base, coriaceous, glabrous above; nerves 9 to 11 on each side of the midrib, obscure above, prominent beneath, parallel, anastomosing near the margin, the reticulations obscure; petioles 1 to 1.5 cm. long; stipules caducous. Peduncles 2 or 3 from each branchlet. Flowers white, sessile or short pediceled. Calyx 3 to 4 mm. long obscurely 4-toothed or subtruncate, fulvous pubescent with crisped hairs especially on the margin. Corolla 5 mm. long glabrous outside, the throat villous within, 4-cleft to or below the middle, the lobes oblong-ovate, obtuse, 2 to 3 mm. long. Filaments and anthers each about 1 mm. long, the latter elliptical-oblong. Ovary 2-celled, each cell with one ascending ovule; style about 2 mm. long. Fruit unknown.

LUZON, District of Lepanto, Mount Data (4490 *Merrill*) November, 1905. In the mossy forest at 2,200 m.

Related to *Psychotria bataanensis* Elmer, differing from that species in its elongated peduncles, densely crisped fulvous pubescent branches, petioles, under surface of its leaves and inflorescence. The leaves in the present species are always acute at the base, while in *P. bataanensis* they are narrowly cordate or auriculate.

CAPRIFOLIACEÆ.

LONICERA Linn.

Lonicera philippinensis Merrill sp. nov.

A scandent glabrous or nearly glabrous shrub 2 to 3 m. high, with 2-lipped corollas about 1.5 cm. long. Branches dark brown, glabrous, shining obscurely angled, slender, the young parts sparingly hirsute. Leaves narrowly oblong-ovate, entire, acute, the base broad, truncate or subcordate, 2.5 to 4 cm. long, 1 to 2 cm. wide, coriaceous, shining above, quite glabrous or sparingly hirsute on the midrib on both surfaces; nerves about 5 on each side of the midrib, the reticulations distinct;

petioles about 5 mm. long, rugose, sparingly hirsute, becoming glabrous. Flowers white, turning yellowish in age, faintly odorous, in pairs in the upper axils, nearly sessile. Calyx 4 mm. long, ovoid, glabrous, the teeth ovate, acute, 5 mm. long, slightly hirsute-ciliate, the bract linear, glabrous or nearly so, about 3 mm. long. Corolla glabrous outside, hirsute inside, the tube about 7 mm. long. Anthers oblong, 4 mm. long; filaments hirsute. Ovary 3-celled; style about 13 mm. long, slender, hirsute except just below the stigma. Fruit subglobose or ovoid, glabrous, black when mature, 5 to 6 mm. in diameter; seeds few, 2 or 3, about 4 mm. long.

LUZON, Province of Benguet, Pauai (4775 *Merrill*) November 8, 1905. In thickets, border of mossy forest at about 2,200 m.

A species of the § *Nintooa*, subsect. *Breviflorae*, apparently most closely related to *Lonicera glabrata* Wall., of the Himalayan region, and quite distinct from the only other known Philippine species of the genus, *L. rehderi* Merr., which is also known only from the same province as is the present species.

CUCURBITACEÆ.

ZANONIA Linn.

Zanonia philippinensis Merrill sp. nov.

Scandent in large trees reaching a height of from 30 to 50 m. Branches rather slender, striate, glabrous, grayish brown. Tendrils glabrous 8 to 10 cm. long or more. Leaves ovate, the base broad, somewhat cordate, coriaceous, glabrous, shining on both surfaces, paler beneath, the apex acute, 15 to 24 cm. long, 10 to 12 cm. wide, 3-nerved from the base, the lateral nerves prominent, few, distant; petioles 2 to 3.5 cm. long. Flowers unknown. Fruit subglobose, brown, glabrous, somewhat shining, the pericarp brittle when dry, about 20 cm. in diameter. Seeds indefinite, elliptical, flattened, 2.5 cm. long, 1.5 cm. wide, wings membranous, surrounding the seed, each about 6 cm. long, 4 cm. wide, the base entire, curved, the apex irregularly lobed or toothed.

MINDANAO, Lake Lanao, Camp Keithley (324 *Mrs. Clemens*) February, 1905. A species evidently related to the Malayan *Zanonia macrocarpa* Blume, differing from the latter in its cordate leaves, smaller seeds which have much wider and somewhat longer wings than in Blume's species. Of this genus, *Zanonia indica* Linn., has been reported from the Philippines by F.-Villar, but his record has never been verified.

CAMPANULACEÆ.

PRATIA Gaud.

Pratia begonifolia Lindl. Bot. Reg. t. 1373; Clarke in Hook. f. Fl. Brit. Ind. 3 (1881) 422; Forbes & Hemsl. Journ. Linn. Soc. Bot. 26 (1889) 2.

LUZON, Province of Benguet, Sablan (6201 *Elmer*) April, 1904; Baguio to Ambuklao (4369 *Merrill*) October 24, 1905. Growing on steep damp banks in ravines. Japan to Central and Southern China, Formosa, Eastern India, and Malaya.

No species of the genus previously reported from the Philippines.

WAHLENBERGIA Schrad.

Wahlenbergia bivalvis Merrill sp. nov.

An erect, glabrous, lax, branched, annual herb 20 to 40 cm. high with linear or linear-lanceolate entire leaves and solitary, long peduncled, blue flowers, the capsule 2-celled, 2-valved at the apex inside the persistent calyx teeth. Branches slender, terete. Leaves 1.5 to 3 cm. long, 1 to 4.5 mm. wide, acuminate, sessile or the basal ones petioled and sometimes sparingly pilose, the margins thickened, the lateral nerves obsolete. Peduncles solitary, slender, 10 cm. long or less. Calyx glabrous, 5 mm. long, the tube 3 mm. long, oblong-ovoid, the lobes 5, erect, linear-lanceolate, acute, 2 mm. long. Corolla blue, campanulate, about 7 mm. long, 5-lobed, the tube nearly 3 mm. long, the lobes oblong, acute, about 2 mm. wide. Stamens free; anthers narrow, 2 mm. long. Ovary inferior, 2-celled; style nearly 4 mm. long; stigma broadly lobed. Capsule membranous, oblong, 6 mm. long, 3 mm. in diameter, 2-celled, 2-valved at the apex inside the persistent erect calyx teeth, the apex convex, subconical. Seeds indefinite, elliptical-oblong, glabrous, 0.5 mm. long.

LUZON, Province of Benguet, Mount Tonglon (Santo Tomas) (4811 *Merrill*) November 12, 1905; Baguio to Ambuklao (4361 *Merrill*) October 24, 1905: District of Lepanto, Mount Data (4559 *Merrill*) November 4, 1905.

A species apparently distinct from *Wahlenbergia gracilis* A. DC., especially in its 2-celled, 2-valved capsules, growing on dry open grassy slopes in thin pine forests 1,600 to 2,100 m., widely distributed but not abundant.

COMPOSITÆ.

AINSLIAEA DC.

Ainsliaea reflexa Merrill sp. nov.

Erect, simple, the leaves mostly radical, long petioled, the petioles winged-margined, the inflorescence long, racemose, the heads 3-flowered, about 12 mm. long, solitary or in pairs. Stems glabrous, terete, simple, erect 20 to 60 cm. tall with few reduced linear-lanceolate leaves. Radical leaves membranous, glabrous or with few long hairs beneath and on the midrib above, the blade elliptical-oblong to oblong-ovate, 2.5 to 6 cm. long, 1 to 2 cm. wide, acute, with distant, short spinulose teeth the nerves 2 to 3 on each side of the midrib, rather abruptly contracted at the base; petioles narrowly winged, much exceeding the lamina 6 to 8 cm. long. Heads narrow, pedicellate, the pedicels 2 to 3 mm. long, pubescent, mostly reflexed, at least in anthesis. Involucral bracts sparingly pilose with scattered hairs, the lower ones 1.5 mm. long, ovate to lanceolate, acuminate, the inner ones linear-lanceolate to linear-oblan- ceolate, 12 mm. long, about 1.8 mm. wide. Achenes 4.5 to 5 mm. long, 10 ribbed, somewhat compressed, about 1 mm. thick above, pilose with scattered spreading white hairs; pappus brownish, the bristles about 30 on each achene, 6 to 7 mm. long, plumose-pilose with 1 mm. long hairs.

LUZON, District of Lepanto, Mount Data (4571 *Merrill*) November 4, 1905. Abundant in the mossy forests at about 2,200 m.

Another form of this species is apparently represented by No. 4824 *Merrill*, Mount Tonglon, Province of Benguet, Luzon, November 12, 1905, this number growing under similar conditions as the preceding, but with the petioles scarcely exceeding the leaf blade in length. No species of the genus has previously been reported from the Philippines, the present species being apparently related to *Ainsliaea pteropoda* DC.

CARPESIUM Linn.

Carpesium cernuum Linn. Sp. Pl. (1753) 859; Clarke in Hook. f. Fl. Brit. Ind. 3 (1881) 300; Forbes & Hemsl. Journ. Linn. Soc. Bot. 23 (1888) 430.

LUZON, Province of Benguet, Mount Tonglon (4832 *Merrill*) November 12, 1905; Suyoc to Pauai (4688 *Merrill*) November 7, 1905; District of Lepanto, Mount Data (4512 *Merrill*) November, 1905.

A decidedly interesting addition to our knowledge of the northern element in the Philippine flora, growing in the mossy forests on the higher mountains and ridges above 2,000 m., no species of the genus having been previously reported from the Philippines. The form here referred to *Carpesium cernuum* Linn. is apparently closest to the var. *glandulosum* Clarke in Hook. f. Fl. Brit. Ind. 3 (1881) 301.

This exceedingly variable species extends from France to the Caucasus, the temperate Himalayan region, Khasia and Nilgherry Mountains, China, and Japan, also according to Clarke to Java. I can find no record of its having been found in southern China or Formosa although another species, *C. abrotanoides* Linn., has been encountered in the latter place.

DICHROCEPHALA DC.

Dichrocephala chrysanthemifolia DC. Prodr. 5 (1836) 372; Hook. Fl. Brit. Ind. 3 (1881) 245; Forbes & Hemsl. Journ. Linn. Soc. Bot. 23 (1888) 406.

LUZON, District of Lepanto, Mount Data (4533 *Merrill*) November, 1905. On dry grassy slopes in thin pine forests at about 2,000 m., the second species of the genus to be found in the Philippines. China to British India and tropical Africa.

EMILIA Cass.

Emilia pinnatifida *Merrill* sp. nov.

An erect, simple or slightly branched herb 15 to 35 cm. high with glabrous or more or less pubescent usually finely lyrate lobed leaves, the involucre bracts much shorter than the flowers. Stems glabrous, finely channeled. Leaves various, the radical ones sessile or short petioled, 4 to 5 cm. long or less, 1 to 1.5 cm. wide, glabrous or with scattered weak hairs beneath, the lobes irregular, 2 to 4 mm. wide, often extending nearly to the midrib, their margins irregularly crenate, the terminal lobe usually larger than the lateral ones; cauline leaves similar to the radical, sessile, clasping, few, the lower ones as long as the radical leaves, the upper one much reduced. Peduncles 2 to 7 cm. long. Heads 1 cm. long, the flowers pink. Involucre bracts glabrous, 1-seriate, 7 to 8 mm. long, about 5 mm. wide, oblong-lanceolate, acute or slightly acute, about 5-nerved. Achenes when mature nearly 3 mm. long, obscurely angled, finely pubescent; pappus copious, soft, white, about 6 mm. long, minutely scabrid. Corollas slender, 7 to 8 mm. long, 5-lobed, the

lobes lanceolate, acute or obtuse, about 2.5 mm. long. Style arms nearly 1.5 mm. long. Anthers slender, 3 mm. long or less.

LUZON, Province of Benguet, Bugias (4664 *Merrill*) October 28, 1905. The following specimens are apparently referable here: Benguet, Baguio (6599, 6606 *Elmer*) June, 1904; (4265 *Merrill*) October, 1905.

A species characteristic of the open, dry, grassy slopes in thin pine forests from 1,500 to 2,100 m., widely distributed in Benguet and Lepanto; abundant. The species here proposed differs from *Emilia sonchifolia* DC., in the involueral bracts being constantly much shorter than the flowers, in this character approaching *Emilia flammea* Cass. As in *Emilia sonchifolia*, the species is exceedingly variable, but is apparently distinct from all other previously described forms. *Emilia sonchifolia* *Elmer*, in herb.

GYNURA Cass.

Gynura clementis *Merrill* sp. nov.

Scandent, more or less pubescent with crisped hairs throughout. Branches dark brown, obscurely angled, ferruginous crisped pubescent with scattered hairs. Leaves alternate, elliptical-oblong to narrowly oblong-obovate, 5 to 8 cm. long, 1.5 to 3.5 cm. wide, coriaceous, acute at both ends, coarsely irregularly toothed, the teeth acute, the upper surface subscabrid, the lower rather densely ferruginous pubescent; nerves 5 to 6 on each side of the midrib; petioles 0.8 to 1.5 cm. long, pubescent, the stipules orbicular, often 1 cm. in diameter. Heads purplish, about 25-flowered, 1.5 cm. long or less, in few flowered axillary and terminal corymbs 10 cm. long or less. Involucre cylindrical or subcampanulate, the bracts 8, oblong-lanceolate, acute, 7 to 8 mm. long, 1.5 to 2.5 mm. wide, somewhat pubescent with crisped hairs, and with several short linear bracteoles at the base. Flowers homogamous, purplish, slender, about 12 mm. long including the achene, the tube 7 mm. long, the upper slightly expanded portion about 3 mm. long, the teeth 5, lanceolate, acute, 1.5 mm. long. Stamens 5; anthers 2 mm. long, lanceolate, the cells not produced at the base. Style arms 3 mm. long, slightly pubescent. Achenes oblong, 3 mm. long, brown, about 10-ribbed, sparingly hispid. Disk glabrous, pitted.

MINDANAO, Lake Lanao, Camp Keithley (49 *Mrs. Clemens*) January, 1906.

MYRIACTIS Less.

Myriactis humilis *Merrill* sp. nov.

An herb 20 cm. high or less, sparingly pilose or nearly glabrous, with long petioled deeply and coarsely pinnately lobed leaves and solitary long peduncled heads about 7 mm. in diameter. Branches few, terete, with few scattered weak hairs. Leaves membranous, 3 to 5 cm. long, 1.5 to 3 cm. wide, coarsely lyrate-lyobed, the lobes entire or coarsely toothed, apiculate, both surfaces with few scattered weak hairs, the upper leaves much smaller, the uppermost entire and bract like; petioles 1 to 3 cm. long. Peduncles slender, 5 cm. long or less, solitary. Heads 5 mm. long, the ray flowers short, white, the disk flowers greenish yellow;

involucral bracts 2-seriate, narrowly oblong, obtuse or acute, sparingly pilose on the median portion, about 4 mm. long, 1 mm. wide. Ray flowers pistillate, ligulate, 2 or more seriate, the ligule oblong about 1.5 mm. long or less; style short, 2-cleft at the apex. Disk flowers greenish yellow, tubular, hermaphrodite. Corolla 1.5 mm. long, regularly 5-cleft, the lobes 1 mm. long, acute. Anthers oblong-ovate, acute, the base obtuse. Style equaling the corolla, 2-cleft at the apex. Achenes compressed, glabrous, oblong, the margins thickened, 3 mm. long, 1.2 mm. wide, tipped with a short somewhat glandular ring. Pappus 0.

LUZON, District of Lepanto, Mount Data (4530 *Merrill*) November, 1905. Common in the damp, mossy forests at 2,100 m. and above. The first species of the genus to be reported from the Philippines.

SENECIO Linn.

Senecio luzoniensis Merrill sp. nov.

An erect, stout, glabrous, simple or sparingly branched herb about 1 m. high, with oblong-lanceolate, coriaceous, rather obscurely irregularly crenate leaves and terminal corymbose many flowered panicles, the heads about 1 to 1.3 cm. long, 1.5 cm. or more in diameter, including the rays. Stems terete, firm, glabrous, reddish brown. Leaves 10 to 15 cm. long, 1.5 to 2.5 cm. wide, glabrous, strongly reticulate veined, the upper ones sessile or subsessile, the lower ones petiolate, the petiole 1 cm. long, base acute, apex usually long acuminate. Panicles about 15 cm. long, nearly as wide, the branches ascending, the bracts and bracteoles linear, the primary branches subtended by linear 3 to 4 cm. long leaf-like bracts, the bracteoles usually about 2 or 3 mm. long. Heads about 25-flowered; involucral bracts about 13, 1-seriate, imbricate, free, oblong-lanceolate, 7 to 8 mm. long, 1.5 to 2 mm. wide, acute glabrous, membranous margined, a few short outer bracts at the base. Ray flowers about 6 in each head, yellow, the tube slender, 4 to 5 mm. long, the ligule oblong, 10 to 11 mm. long, 3.5 mm. wide, strongly 4-nerved, obtuse, the apex with three small blunt teeth. Disk flowers yellow, the corolla tubular, inflated above, about 8 mm. long, 5-lobed, the lobes about 1.3 mm. long, oblong, blunt. Anthers slender, about 3 mm. long, blunt at the base. Style 2-cleft, the arms about 1.5 mm. long, truncate. Achenes about 4 mm. long, less than 1 mm. thick obscurely 10-striate, glabrous, narrowly oblong. Disk paleaceous.

LUZON, Province of Benguet, Suyoc to Pauai (4791 *Merrill*) November 7, 1905. A stout erect herb growing in grass lands on high ridges near the lower limits of the mossy forest at about 2,150 m.

SOLIDAGO Linn.

Solidago virgaurea Linn. Sp. Pl. (1753), 880.

LUZON, Province of Benguet, Baguio to Ambuklao (4364 *Merrill*) October 24, 1905. Widely distributed in the region of *Pinus insularis* Endl., 1,500 to 2,000 m. North America, Europe, and temperate Asia south to Formosa.